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THE DIAGNOSIS AND SERUM TREATMENT OF ANTERIOR POLIOMYELITIS*

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In the treatment of the acute stages of poliomyelitis the application of immune serum from human beings who have recovered from the disease has been recommended by Netter,[1] who used such serum in a small series of cases. His conclusions were that the serum was beneficial in poliomyelitis. Later, Flexner and Lewis[2] carried out some experimental work in monkeys, and showed that the intraspinal injection of immune serum twenty-four hours before the intracerebral inoculation of a fatal dose of virus acted as a preventive against the disease.

On the basis of these results, the work with immune serum was taken up at the Willard Parker Hospital, at the Minturn Hospital and in the private practice of a number of physicians to whom the serum was supplied for treatment of suitable cases. It was soon realized that the cases in the preparalytic stage of the disease would be the most suitable for serum treatment, and that late cases with well developed paralysis and normal temperature would probably not be influenced by the administration of serum. The serum was also used, however, in cases in which the temperature was still high, the paralysis had developed in some parts, and was progressively involving other members of the body.

It was in the group of early cases, treated in the premonitory or preparalytic stage of the disease, that we could expect to obtain much more tangible results. If paralysis did develop after the use of serum, the following points were noted:

1. The number of doses and amount of serum used each time.
2. The group to which the serum belonged.
3. The number of days the patient had been ill.
4. The number of hours or days which had elapsed since the first dose of serum was given.
5. The degree of paralysis.
6. The rapidity with which the paralytic phenomena began to clear up.
7. The final result: recovery, paresis or paralysis, and the actual groups of muscles affected.

It was only by comparing a larger group of early cases treated with immune serum, with normal human serum, and with no serum at all, that we could hope to arrive at any certain data as to the efficiency of the serum treatment.

To help in the diagnosis of early cases, the following symptoms and findings in the spinal fluid were found of value. The macroscopic changes in the spinal fluid to be described cannot replace the more careful laboratory examination, but will be found of great value, especially where immediate laboratory facilities are not at hand, and the diagnosis of poliomyelitis has to be confirmed for purposes of isolation and treatment.

SYMPTOMS OF EARLY CASES

A certain group of symptoms have been found significant, especially if occurring during an epidemic, in the early stages of infantile paralysis. These symptoms are present in part or in whole in most of the cases. In addition to the history of exposure, which is especially important during an epidemic, we have: (1) fever; (2) hyperesthesia; (3) slight rigidity of the neck, with pain on forward traction, and occasionally a slightly positive Kernig's sign; (4) muscular tremors, irregular from fine to coarse, noticeable especially in the fingers and hands, but also apparent in the entire extremities; (5) weakness of the limbs, especially of the lower extremities, with early diminution or loss of the patellar reflexes; (6) headache; (7) nausea, vomiting and constipation or diarrhea, and (8) the character of the spinal fluid obtained by lumbar puncture in suspicious cases.

This fluid, with a few exceptions, is quite characteristic even in the early stages of the disease. There is a distinct increase in the total number of cells, from 20 to 600 or more. These cells are mostly lymphocytes, with a small proportion of large mononuclear and polynuclear cells. During the earliest stages of the disease there may be a transient relative and absolute polynucleosis. The chemistry of the fluid is also characteristic. There is an increased amount of albumin, globulin, and a substance which reduces Fehling's solution. Often on the surface of the spinal fluid, as it is being drawn into a test tube, a thin filament of fibrin appears, which breaks up into small flakes when the fluid is gently shaken. The diagnosis in a large percentage of cases can be established in the early cases during the acute stage of the disease, even before the laboratory examination of the spinal fluid, by noting a slight but characteristic opalescence to the fluid which gives a ground-glass appearance throughout the fluid when it is examined in a clean test tube by transmitted light. This appearance is caused by the increased number of white blood cells (lymphocytes), which can be distinctly seen with the naked eye, and still better with a pocket magnifying lens. The large number of lymphocytes appear as dustlike little specks uniformly

* From the Research Laboratory and the Willard Parker Hospital.

1. Netter, A.: Serotherapie de la poliomyelite nos resultats chez trente-deux malades: indications, technique, incidentes possibles, Bull. de l'Acad. de méd., Oct. 12, 1915. Netter, A., and Salanier, M.: Bull. et mem. Soc. méd. d. hôp. de Paris, March 10, 1916.
2. Flexner, Simon, and Lewis, P. A.: Experimental Poliomyelitis in Monkeys, Seventh Note, THE JOURNAL A. M. A., May 28, 1910, p. 1780; Eighth Note, Aug. 20, 1910, p. 662.

suspended in the fluid. These particles can be put into motion by a slight shaking movement of the test tube. A normal spinal fluid, or a poliomyelitis fluid which has been standing for a number of hours, and in which the cells have settled to the bottom, does not present this appearance unless the cells are distributed again by shaking. It looks limpid and gives the appearance of distilled water. The examination of the spinal fluid is best made in the dark room with the test tube held against an artificial light. It is not as accurate a test of cell increase as the exact count, but is of great practical value.

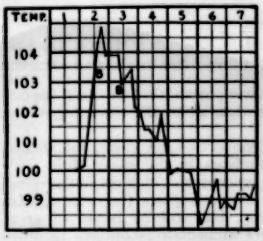

Chart 1.—Typical curve in preparalytic case of poliomyelitis in which immune serum was given and which ended in complete recovery: *B*, injection of 15 c.c. immune serum B.

Any bedside test by which cases of poliomyelitis can be diagnosed during the early stages is important both for purposes of isolation and for serum treatment. Several precautions must be observed in utilizing this test. First, there must be no red blood cells in the spinal fluid. Red blood cells, if only few in number, cannot be distinguished macroscopically by the appearance of the fluid, and the opalescence produced by these cells may be mistaken for that caused by white blood cells. When more numerous, however, the red cells are recognized by a characteristic yellowish shimmer to the fluid. A subsequent microscopic examination should, at any rate, always be made to exclude the presence of red blood cells. Second, white blood cells (lymphocytes and polynuclears) are found increased in the spinal fluid in a variety of other conditions, especially tuberculous meningitis, epidemic cerebrospinal meningitis, syphilitic involvement of the meninges and vessels of the brain, etc. The typical macroscopic ground-glass appearance of the fluid cannot, therefore, be of absolute, but is of great relative diagnostic value during an epidemic, if the precautions mentioned above have been observed.

In the later stages of poliomyelitis, generally after the seventh to tenth day, the cells in the spinal fluid rapidly diminish in number and soon reach a normal count. It is often important to establish the diagnosis of these later stages of the disease, especially when no paralytic phenomena have appeared after the attack. A simple and yet fairly accurate way of diagnosing these cases is to remove the spinal fluid by lumbar puncture and examine its albumin and globulin content. For a period of from eight to ten weeks, a majority of persons who have passed through an attack of poliomyelitis will show an increased amount of both these substances. This is strongly suggestive of an attack of the disease during an epidemic, especially with a history of some or all of the preparalytic symptoms of poliomyelitis.

Table 1 shows rather strikingly the persistence of the albumin increase (the globulin is generally in proportion to the albumin content) even as late as eight weeks after the onset of the symptoms. It is interesting to note that the maximum amount of albumin is found in a much larger proportion of cases during the second week rather than during the first of the disease. It is possible, therefore, to clear up the diagnosis of some of the abortive types of poliomyelitis even during the later stages of convalescence.

In addition to the ground-glass appearance of the fluid, which is a useful test to determine an increased number of cells and of value in the early stages of poliomyelitis, there is a second macroscopic test, of value both early and late in the disease. This is the so-called foam test, and depends on the pathologically increased amount of albumin and globulin in the spinal fluids in cases of poliomyelitis. When a test tube which is half filled with spinal fluid is thoroughly shaken, a persistent foam appears on the surface, which may last for half an hour to an hour or even longer. Compared with a normal spinal fluid, the foam produced by shaking a fluid obtained from poliomyelitis patients is much denser, finer, more voluminous and more persistent. Here, also, the presence of blood must be excluded before any definite deductions from this test are made.

The importance of getting a spinal fluid free from blood, which occasionally results from the lumbar puncture, is evident from the diagnostic value attached to the findings in a clear spinal fluid obtained from early and late cases of poliomyelitis. After using a variety of lumbar puncture needles, I have become thoroughly convinced that the needle for diagnostic puncture should not be larger than a No. 18 gage and not longer than 3 inches. Such a needle is easily handled, does not bend, and causes little trauma and very little pain. With the patient placed in the proper recumbent position, and the back properly arched, the needle is introduced almost vertically, but with a slight upward direction, in the median line between the third and fourth lumbar vertebrae on a level with the crest of the ilium. Anesthesia, either local or general, is, as a rule, unnecessary. When the child struggles considerably, and the examination of the spinal fluid is of great importance in clearing up the diagnosis, a light ether anesthesia for a few minutes is justifiable and indicated.

SERUM TREATMENT

The diagnosis in the early cases having been established by clinical symptoms and examination of the spinal fluid, the next step is to administer the serum into the spinal canal. It is here that the bedside confirmation of the diagnosis by the macroscopic appearance of the spinal fluid becomes most important. In cases in which the fluid indicates it, the serum can be promptly administered without any further delay for laboratory examination and without the necessity of another lumbar puncture, although the confirmatory laboratory examination can be made later.

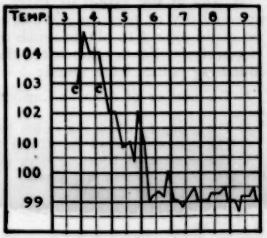

Chart 2.—Typical curve in preparalytic case of poliomyelitis in which immune serum was given and which ended in complete recovery: *C*, injection of 15 c.c. immune serum C.

Fifteen c.c. of the serum are injected by the gravity method after the removal of a slightly larger amount

of spinal fluid. The dose is repeated every twenty to twenty-four hours until two or possibly three injections have been made. In the more severe cases, especially with an advancing involvement of the respiratory muscles, the serum should be given every twelve hours. In considering the frequency of the repetition of the dose, and especially of the interval of time between the injections, it is important to remember what is taking place in the cerebrospinal meninges after an injection of the serum. A marked polynuclear cellular reaction is produced, which probably should be given time to exert its full effect before the spinal canal is tapped again and the rich cellular fluid removed, for the administration of a second or third dose of serum. If, however, one delays the reinjection of the serum for forty-eight hours longer, there will be noticed a rapid clearing up of the artificially produced cellular increase in the spinal fluid. Considering this therapy as a possible nonspecific cellular stimulation obtained by the injection of a rich protein fluid, we would consider that an interval of from twenty to twenty-four hours between the injections is best; but it is fair to state that in three severe cases the readministration of the serum was made every twelve hours with apparently good results. The serum is rapidly absorbed from the spinal canal, so that the daily repetition of the dose is indicated, especially if the efficiency of the serum is considered as being based in part on its antibody content.

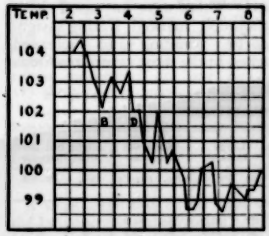

Chart 3.—Typical curve in preparalytic case of poliomyelitis in which immune serum was given and which ended in complete recovery: *B*, injection of 15 c.c. immune serum B; *D*, injection of 15 c.c. immune serum D.

SOURCE OF SERUM AND GROUPS OF IMMUNE SERUM

The immune serum used in the treatment of cases of infantile paralysis was obtained from convalescents and from immune donors who had had the disease from one to several years previously. For the sake of accuracy, and to facilitate the proper study of its action, the serum was classified into groups, according to the number of years which had elapsed since the immune donors had had the disease. It was important in choosing donors for immune serum to establish the fact that they had really suffered from infantile paralysis, and not to accept the diagnosis of the donor on his word, as cases of Bell's palsy, tuberculous disease of the bones and joints, hemiplegias, syphilitic and otherwise, could be found among such so-called immune donors.

The groups into which the serum was divided are:

Early convalescent serum, from two to six months after an attack.

Late convalescent serum, from six to twelve months after an attack.

Group A Serum, from one to five years after an attack.

Group B Serum, from five to fifteen years after an attack.

Group C Serum, from fifteen to thirty years after an attack.

Group D Serum, from thirty years up after an attack.

METHOD OF OBTAINING AND PREPARING SERUM

(*a*) *Amount.*—To obtain the immune serum, the blood is drawn from suitable donors in quantities varying with the age, weight and apparent hemoglobin content of the individual. On an average, it is safe to withdraw 2 ounces from children 9 to 10 years of age, 3 to 4 ounces from children 12 to 13 years of age, and from 4 to 6 ounces from persons 18 years of age and over. Adults, especially robust, full-blooded persons, can furnish from 10 to 16 ounces of blood. Similar amounts of blood can be safely withdrawn again at the end of two to three weeks.

(*b*) *Technic—Obtaining the Blood.*—The blood is obtained by means of a No. 15 gage steel or platinum needle, to which a small piece of rubber tubing is attached. In children, adults and stout persons with small or indistinct veins, the blood is withdrawn by means of a 1 ounce record syringe, and a No. 17 gage needle. The blood is collected in small square bottles in quantities of from 1 to 2 ounces and given a long slant so as to obtain as broad a surface for the separation of the serum as is possible.

(*c*) *Preparation of the Serum.*—The blood is allowed to clot, and the bottles are placed in the ice box during the following twenty-four hours to allow a separation of the serum. This is decanted the following day and centrifuged to free it from pieces of blood clot and red blood cells. To the serum is next added a preservative in the form of 0.2 per cent. tricresol. This is added in a 25 per cent. solution in quantities of 4 c.c. to every 500 c.c. of serum. The serum is then allowed to remain in the ice box for forty-eight hours, so that a fine precipitate, which forms after the addition of the tricresol, separates out and is removed. The serum is then passed through a Berkefeld stone filter, either by suction or by pressure, bottled in quantities of 15 c.c. in dark amber or blue bottles, and kept cold in the ice box. The tricresol was found to increase the local irritant effect of the serum, and it may be advisable not to add it as a preservative.

(*d*) *Duration of Efficiency of the Serum.*—If the serum has been preserved with tricresol, or handled with sterile precautions after it has been passed through the Berkefeld filter, and is afterward kept in a cold place, it will probably remain efficient in its specific antibody content for a number of weeks. So far the serum has been used up almost as fast as it has been obtained. Some of the serum which had been kept for from four to six weeks seemed to be as active therapeutically as the more recently drawn serum.

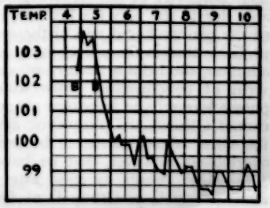

Chart 4.—Typical curve in preparalytic case of poliomyelitis in which immune serum was given and which ended in complete recovery: *B*, injection of 15 c.c. immune serum B.

In an emergency, or when the facilities for treating the serum are not obtainable, the blood is simply drawn in a perfectly aseptic condition into a vessel with glass beads, shaken and centrifuged; or the serum drawn in the usual way is allowed to separate during the next few hours, and promptly used, the presence of a few suspended red blood cells

being disregarded entirely. When immune serum is not obtainable, fresh normal serum is procurable at any time from the parents or other relatives of the patient, and can be used within a few hours. Certainly it is advisable not to fail to administer human serum in the treatment of any case of poliomyelitis, because of a lack of already prepared serum.

It is important to note in the preparation of serum, either for stock or fresh without a preservative, that no heat is applied either for inactivation or for sterilization.

Each donor should be otherwise healthy and give a negative Wassermann reaction.

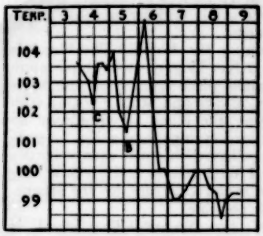

Chart 5.—Temperature curve of a patient with poliomyelitis who developed a facial paralysis eighteen hours after the first dose of immune serum. This patient made a complete recovery: *C*, injection of 20 c.c. immune serum C; *B*, injection of 15 c.c. immune serum B.

RESULTS OF SERUM TREATMENT

The most evident action of the serum was a marked cellular response of the cerebrospinal meninges in the presence of the serum injected by lumbar puncture. This cellular reaction consisted of a very decided increase of the polymorphonuclear cells, which preponderated in some of the cases to the extent of 95 per cent., while the total cell count increased from 500 to 10,000 cells per cubic centimeter. This increase of cells was at times so pronounced that the spinal fluid obtained at the end of twenty-four hours had a very marked turbid, almost purulent appearance, and a heavy sediment of cells was found in the test tube within a few hours after the lumbar puncture. Culturally, these fluids were always found sterile. This cellular response also followed the injection of normal human serum, of normal horse serum, and of the secondary albumoses of Jobling when these serums were used in the same early stages of disease. This high cellular reactivity of the cerebrospinal meninges is probably due to the very marked congestion of the vessels of the pia-arachnoid and of the cerebral cortex. It is probable that in the use of immune serum we have, in addition, the helping factors of antibodies against the virus of poliomyelitis which stimulate the polymorphonuclear cells to increased phagocytic activity. We cannot estimate the phagocytic action of the cells, as the virus is too minute to be seen. It must not be overlooked, however, that we have probably obtained therapeutic results as good after the use of serum from Group C or Group D as from Group A or B. Such serums may have only a problematic value as antiserums, and almost their entire action may depend on the rich protein content of all blood serums. Further experimental work will no doubt have to be carried out in monkeys to determine whether the previous injection of immune serums into the spinal canal of monkeys will have a greater protective value to subsequent infection with active virus than after the injection of normal human serum.

If the injection of immune or of normal human serum was made in the later stages of the disease, when the temperature had already subsided, the cellular response was found much poorer, and only an opalescence of the spinal fluid was noticeable at the end of twenty-four hours. This lessened cellular response is probably due to a subsidence of the acute congestion of the brain and meninges.

Clinically, the injection of immune or of normal human serum was followed within twenty-four hours in the early preparalytic cases by an intensification of the meningeal symptoms. There were increased rigidity of the neck, opisthotonos, marked Kernig's sign, hyperirritability, headache, vomiting and increased temperature which reached in the most severe reactions

TABLE 1.—ALBUMIN CONTENT OF SPINAL FLUID IN POLIOMYELITIS

Days Ill	Total No. Spinal Fluids	Maximum		Large Amount		Moderate Amount		Slight but Distinct Increase	
		No.	Pr. Ct.	No.	Pr. Ct.	No.	Pr. Ct.	No.	Pr. Ct.
1–7	52	8	15.4	22	42.3	18	34.6	4	7.7
7–14	39	20	51.3	10	25.6	6	15.4	3	7.7
14–21	35	12	34.3	7	20.0	11	31.4	5	14.3
21–28	31	8	25.8	12	38.7	7	22.6	4	12.9
28–35	26	3	11.5	4	15.4	14	53.9	5	19.2
35–42	37	1	2.7	8	21.6	18	48.7	10	27.0
42–49	51	4	7.8	14	27.5	20	39.2	13	25.5
49–56	50	2	4.0	11	22.0	26	52.0	11	22.0

up to 104 or 105 F. At times, when the reaction was especially severe, there were twitchings or even convulsive movements of the extremities. These symptoms represented merely a more severe degree of the early preparalytic phenomena of the disease. In some of these cases the temperature was simply caught in its upward rise, and had, therefore, no significance. Definite temperature reactions were, however, noted after the primary and also after secondary injections of serum. The typical curve can be seen in Charts 1 to 4: A rise in temperature, persistence for another twenty-four hours, generally without any further increase after a second dose of serum, and subsidence by a rapid lysis. Charts 5 and 6 show temperature curves of patients who developed paralysis during the course of treatment.

The other symptoms, like rigidity of the neck and Kernig's sign, persisted for from two to three days after the temperature had dropped to normal. Gradually the symptoms cleared up and the patient, if there was no complicating paralysis, made a rapid and uneventful convalescence.

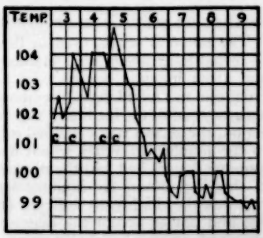

Chart 6.—Temperature curve of a patient with poliomyelitis who developed paralysis of both lower extremities and partial paralysis of both deltoids on the day of the third injection of immune serum. This patient made a partial recovery: *C*, injection of 15 c.c. immune serum C.

The cases treated with immune serum may be divided into three groups:

1. Cases treated at the Willard Parker Hospital.
2. Cases treated at the Minturn Hospital.
3. Cases treated with other physicians.

1. WILLARD PARKER CASES.—A. *Immune Serum Cases.*—(*a*) Preparalytic Cases: Twenty-five:

Type of Serum		No. of Doses	
A	0	One	20
B	1	Two	4
C	17	Three	1
D	7		
	25		25

Results.—(1) Twenty-four remained free from paralysis; (2) one had weakness of both quadriceps extensor (Serum C); (3) none died.

(*b*) Paralytic Cases: Eighty-eight: 1. Thirty-eight patients died: (*a*) Eighteen died in less than twenty-four hours after first dose of serum; (*b*) nine died within forty-eight hours after first dose of serum; (*c*) five died in more than forty-eight hours after first dose of serum; (*d*) two died of tuberculous meningitis; (*e*) one died of gastro-enteritis, and (*f*) three died of pneumonia.

Type of Serum		No. of Doses		Type of Case	
Convalescent	1	One	23	Bulbar	7
A	4	Two	13	Bulbospinal	6
B	10	Three	2	Spinal	23
C	23			Cerebral	1
	38		38	Tuberculous	1
					38

A large proportion of the fatal cases were in children in the last stages of an advancing Landry type of poliomyelitis. Of the eighteen who died within less than twenty-four hours, a majority were moribund, and passed out within a few hours after the administration of a single dose of serum. Many of the patients in this group received the serum only as a last resort. The bulbar cases had well pronounced respiratory difficulty before the serum was injected.

2. Fifty lived:

Type of Serum		No. of Doses		Type of Case	
Convalescent	1	One	39	Bulbar	8
A	6	Two	9	Bulbospinal	2
B	21	Three	1	Spinal	40
C	20	Four	1	Cerebral	0
D	2				
	50		50		50

These patients, at the time of treatment already had a well developed paralysis, but were in a still active stage of the disease, as shown by temperature and a spreading type of lesion. These children recovered and showed a definite clinical improvement; but it is difficult to state how much of the improvement, which is also generally seen in the untreated cases, was due to the administration of the serum, and how much would have taken place during the natural course of the disease.

B. *Normal Serum Cases.*—To determine whether a similar cellular reaction would be produced by the intraspinal injection of normal serum and similar therapeutic results obtained, a series of preparalytic and paralytic cases was treated with serum obtained from persons who had never, to their knowledge, had poliomyelitis. It is, however, recognized that persons who have never had the lesion may have protective substances in their blood.

(*a*) Preparalytic Cases: Ten:

No. of Doses		Results	
One	7	Remained free from paralysis	9
Two	3	Developed bulbar symptoms within 12 hours and died	1
	10		10

(*b*) Paralytic Cases: Thirty-three: 1. Five patients died: (*a*) three died within less than twenty-four hours after first dose of serum; (*b*) one died of sepsis, and (*c*) one died of pneumonia.

No. of Doses		Type of Case	
One	3	Bulbar	1
Two	2	Spinal	4

Two of the children who died within less than twenty-four hours had advanced ascending spinal cases of the Landry type, and one a bulbar case.

2. Twenty-eight patients lived:

No. of Doses		Type of Case	
One	21	Bulbar	5
Two	7	Spinal	23

There was a distinct clinical improvement in the patients who recovered, but whether more than would naturally take place without the use of serum it is difficult to say.

The final results of the Willard Parker Hospital cases were obtained from the hospital records, since I followed up some of the cases for only a short time after the injections of serum.

2. MINTURN HOSPITAL CASES.—(*a*) Preparalytic Cases: Fifteen:

Type of Serum		No. of Doses	
A	0	One	0
B	5	Two	11
C	9	Three	2
D	1	Four	2
	15		15

Results: (1) Nine remained free from paralysis; (2) two developed paralysis within less than twenty-four hours: (*a*) bulbar, with complete recovery (B), and (*b*) facial, with complete recovery (C); (3) four developed paralysis after forty-eight hours: (*a*) facial, with complete recovery (B); (*b*) internal strabismus, with complete recovery (C); (*c*) both lowers and left deltoid, with marked improvement (C), and (*d*) both lowers, both deltoids, with final improvement (C).

This series represents an interesting and valuable group of cases. Each patient was fully treated and carefully observed for a period of eight weeks, and the clinical results lead one to the conclusion that the serum was distinctly beneficial in the treatment of these preparalytic cases.

(*b*) Paralytic Cases: Eighteen:

Type of Serum		No. of Doses		Type of Case	
A	3	One	7	Bulbar	2
B	3	Two	7	Spinal	16
C	12	Three	2		
D	0	Four	2		
					18

Results: Fifteen recovered with improvement of paralysis; three died: (1) two Landry spinal, and (2) one bulbar.

The cases in this group represent chiefly the usual spinal type, in an active stage of the disease, as shown by the short history and the presence of high temperature. The fatal cases were seen and treated at a time when the prognosis seemed to be very doubtful.

In addition to the serum-treated patients there were at the Minturn Hospital forty-one patients who received no serum. The majority of these cases came under observation during the stage of convalescence.

3. CASES TREATED WITH OTHER PHYSICIANS.—These patients were personally observed and treated.

(*a*) Preparalytic Cases: Fourteen. No patients died.

Type of Serum		No. of Doses	
A	3	One	7
B	7	Two	3
C	2	Three	4
D	2		
	14		14

Results: Eleven remained free from paralysis; three developed paralysis: (1) facial and strabismus with complete recovery (A); (2) anterior tibial groups with marked improvement (D), and (3) paresis of both upper eyelids with recovery (C).

This group of cases treated in the preparalytic stage of the disease is also interesting in the large number of complete recoveries which followed the treatment with immune serum.

(*b*) Paralytic Cases: Thirteen:

Type of Serum		No. of Doses		Type of Case	
A	1	One	6	Bulbar	2
B	3	Two	2	Bulbospinal	1
C	8	Three	5	Spinal	10
D	1				
	13		13		13

Results: Nine patients recovered with improvement in paralysis; four died: (1) three Landry spinal, and (2) one bulbar.

The bulbar patient died within two hours. It was a far advanced case, and the prognosis was poor. Of the three Landry spinal patients, two died within less than twenty-four hours after treatment.

In addition to these cases that were seen personally, the serum was supplied to physicians for over 200 cases. The reports obtained from the physicians are not complete, but the cases reported indicate results similar to those detailed above.

4. CONTROL CASES.—It is very difficult indeed to state definitely to what extent the results obtained with serum could

be ascribed to the action of the serum alone, either as a specific or as a nonspecific form of treatment. As stated above, the natural course of the disease is variable. For purposes of control, therefore, a series of twelve nontreated preparalytic cases was taken without selection from the records of the Willard Parker Hospital.

Control Preparalytic Cases: Twelve: (*a*) Five remained free from paralysis; (*b*) seven developed paralysis: (1) bilateral ptosis with little movement of eyeballs; (2) complete facial paralysis; (3) paresis of right arm and left leg; (4) paresis of right leg; (5) paresis of neck muscles; (6) paresis of both quadriceps extensor; (7) paralysis of both lower extremities.

At the Minturn Hospital there were three nonparalytic patients, admitted eight days after the onset of the symptoms, who remained free from paralysis. Of two preparalytic patients, one developed strabismus and one paresis of both lower extremities.

Table 2 gives a summary of the cases treated with immune and with normal human serum. It is interesting to see that of fifty-four preparalytic cases treated with immune serum, forty-four remained free from paralysis, while of the ten who developed some form of paralysis, five made a complete final recovery. The results with normal serum seem to be very favorable, but the number of cases treated in the preparalytic stage of the disease is too small, and a larger series of cases should first be treated before final deductions are made. The high mortality among the paralytic cases is explained by the desperate condition of many of the patients at the time the treatment was administered.

TABLE 2.—SUMMARY OF CASES

Institution	Total	1. Preparalytic				2. Paralytic			
		No Paralysis	Paralysis with Final Recovery		Died	Total	Recovered		Died
			Complete	Partial			Complete	Partial	
Treated with (a) immune human serum:									
Willard Parker Hospital	25	24	..	1	0	88	5	45	38
Minturn Hospital	15	9	3	3	0	18	2	13	3
With other physicians	14	11	2	1	0	13	1	8	4
Total	54	44	5	5	0	119	8	66	45
Treated with (b) normal human serum:									
Willard Parker Hospital	10	9	..	..	1	33	4	28	5

COMMENT

It is known that in poliomyelitis we have a group of abortive nonparalytic patients who go through the premonitory symptoms, but do not terminate in paralysis. It is difficult to state, therefore, how many of the patients treated with serum would have remained free from paralysis without serum treatment. The results and the conclusions from any form of treatment in a disease which is so variable in symptomatology and in prognosis, both as to life and disability, must be given with reserve. It seemed to me, however, that the action of serum in poliomyelitis is beneficial; that the use of serum from recent immune donors is preferable to normal serum, but that human serum is indicated in the treatment of the acute stages, especially in the preparalytic period of the disease. When carefully observed and controlled, the treatment is harmless. A distinct reaction follows in some of the cases after the first dose; the reaction is less marked after the second, and little, if any, is noted after the third injection of serum.

Two groups of cases seemed to give an unfavorable prognosis even in the earlier stages of the disease. One was the fulminating bulbar type with a rapidly progressive involvement of the respiratory center. The second type was a spinal paralytic form which impressed itself by the possibility of mistakes in diagnosis, the very acuteness of the course of the disease, and the hopelessness of any form of treatment. The type referred to is one which begins with symptoms of rapid respiration which suggest for a few hours the diagnosis of pneumonia. The paralytic phenomena, however, soon became manifest and rapidly spread, involving all the extremities and resulting fatally within from twelve to eighteen hours after the onset of respiratory symptoms. The clinical picture suggests an overwhelming involvement of the cerebrospinal axis, in which the intercostal and other accessory muscles of respiration show, because of their vital functional activity, the earliest paralytic symptoms.

In the later cases, which were treated after the paralysis had already made a distinct headway and was beginning to involve the muscles of respiration, the serum showed possibly in a certain proportion of cases an inhibitory effect on further progress, which resulted in a saving of life. It is difficult to forecast, however, what the natural result of the disease would have been in these cases. Control patients without serum, in whom the muscles of respiration were involved at the time the patients came under observation, have also recovered. It seemed, however, that a larger number of serum-treated patients of the same degree of severity had remained alive than would have without the use of serum. No very definite judgment of the value of serum can be based on the results obtained in these cases. Yet, as a possible life-saving procedure, we should continue to use the serum even in these cases and in the course of time obtain more definite results.

SUMMARY AND CONCLUSIONS

1. The injection of immune and of normal human serum into the spinal canal during the acute febrile stage of poliomyelitis causes a distinct cellular reaction which is mostly polynuclear in type.

2. The phagocytic action of these cells is beneficial in poliomyelitis.

3. Such action is enhanced in immune serum by the presence of specific antibodies.

4. It is preferable to use fresh serum, or serum which has been obtained under sterile precautions, passed through a Berkefeld filter and bottled without the addition of a preservative.

5. The presence of a preservative and of hemoglobin in serum enhances its irritating effect, and gives rise to the more severe types of reaction.

6. For purposes of treatment, it is important to diagnose the cases during the preparalytic stage of the disease by the typical group of early symptoms and the changes in the spinal fluid.

7. These symptoms are fever, slight rigidity of the neck, jerky movements and fine tremors of fingers and hands.

8. The diagnosis of poliomyelitis can generally be confirmed in the early stages of the disease by a bedside examination of the spinal fluid which shows macroscopically the ground-glass appearance and a positive foam test. The laboratory examination will show an increased number of lymphocytes, an increased amount of albumin and globulin, and a marked reduction of Fehling's solution.

9. Parents should be instructed to recognize the early symptoms so as to notify promptly the family physician. This is especially important in detecting secondary cases in the same family.

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COMMUNITY TREATMENT OF MALARIA

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My personal interest in the treatment of malaria began at the time when a number of my friends returned from Cuba suffering from this disease. They had been treated for months without obtaining permanent relief. I became more directly interested when some of my friends went to Mexico to take charge of a plantation in what proved to be a region thoroughly infested with malaria.

They went with instructions to take the precautions given in medical books. The plantation was located at sea level within the tropics, traversed by a stream varying in width from 100 to 500 yards. There was a good current and the water was clear. They arrived in November. When I visited them, the following March, I found every white person on the plantation severely ill with malaria. One of them was so ill that the local physician, a graduate of one of the best American schools, told the patient that she would have to return to the United States or go up into the mountains to live if she wished to regain her health, because all the methods which he had found effective in an experience of over twenty years in this vicinity had failed in her case.

It then became known to me that this particular region had been shunned by white people and Indians alike, because of the universal prevalence of malaria. The governor of the state refused to permit members of his family to accompany him on the occasion of his presence in this part of the state at a public celebration, for fear of having them infected with malaria. I mention these facts to make it clear that we had to deal with a serious condition.

It became evident at once that the local physicians, whose experience should have fitted them especially for the treatment of these cases, were entirely unable to produce bearable conditions, and that our Americans would be forced to abandon their enterprise unless we could provide efficient relief.

To work out a plan of procedure, I secured recognized books on tropical diseases, and government bulletins, and learned as much as possible from the natives concerning their experiences.

It soon became clear that many persons thought they were ill from malaria when, as a matter of fact, they were suffering from intestinal infection. An especially intelligent native asserted that bananas caused malaria. On investigating, I found that the bunches of bananas were cut green and hung up to ripen. Flies deposited infectious material on the peel, causing black areas. The natives handled this while eating the fruit, and suffered from fever accompanied with diarrhea. The flies had access to the dejecta, and a vicious circle was established. The disease, called *calentura*, a term generally applied to malaria, was not malaria at all, but another disease quite as bad for the patient. When the bunches of ripening bananas were placed in a carefully screened store room, the peel remained free from black spots and the fruit could be eaten without harm.

It was also found that during the treatment of malaria with quinin, the natives had learned that they made much more rapid progress if they kept the bowels active by the use of some cathartic, and especially by subsisting on hot soups entirely and avoiding beans, meat, eggs and cornmeal cakes.

The form of malaria with an attack of chills every second day was most common, but in some cases exacerbations occurred once a day, and in others once every third day. In most of those that failed to have exacerbations every second day, these would occur every seventh day or on days that were multiples of seven. It was also found that certain patients who had apparently fully recovered would have an exacerbation on a day which was a multiple of seven. In other words, the tropical malaria acted as it does elsewhere.

In view of these facts and the literature on the subject, the following plan of treatment was developed. It differs in several important elements from that employed by the local physicians and physicians in this country in malarial regions, but it is so simple that the ignorant foremen on the ranches and the local druggist have applied it in many hundreds of cases, and it has proved effective in their hands in acute cases in which it has been applied according to the exact directions, and has cured even those patients who had never been free from malaria for years. Several of these had suffered from the disease known in this country as dumb ague for more than twenty years. The local physicians, of course, with a few exceptions, still adhere to the form of treatment which they have employed for years.

The treatment depends on certain well known facts which should be borne in mind:

1. Quinin will kill the adult *Plasmodium malariae*.
2. Quinin will not kill the plasmodium in spore form.
3. Quinin will prevent spores from developing into adult forms.
4. Quinin, if given continuously, will consequently keep malaria spores in the body, which will later cause a recurrence.
5. Quinin must be absorbed in order to be effective.
6. Quinin must be kept constantly in the circulation, at least for forty-eight hours, in order to kill all plasmodia which belong to the one, two and three day type.
7. Quinin taken by mouth will not be entirely eliminated in three hours.
8. Quinin taken by mouth may all be eliminated in six hours.
9. It is consequently necessary to give quinin *night* and *day* at sufficiently short intervals to keep fresh quinin in the blood for at least forty-eight hours continuously.
10. The alimentary canal must be in a condition suitable for the absorption of quinin.

11. Hot water in large quantities should be given with each dose of quinin in order to insure solution and absorption.

12. The use of quinin should be completely interrupted for a sufficient interval after all adult plasmodia have been killed to permit the spores to develop sufficiently to be killed by quinin, but not long enough to permit new spores to form; that is, the interval should be less than seven days.

To avoid tediousness, it will be well to give the plan of treatment in the same simple way in which it was given to the foremen on the ranch, although, when the patients could be kept under personal observation, the treatment was begun on the morning on which the exacerbation was to be expected, that is, at the time when there was a marked increase in the number of parasites in the blood; but practically it seemed that if this was not done, the results were perfectly satisfactory. It should be stated, however, that the treatment was applied, as a rule, not in absolutely latent cases, but in those with active symptoms.

RULES FOR TREATMENT

1. Give an exclusive diet of hot soup for ten days' treatment.

2. On the evening of the first day give 2 ounces of castor oil in fruit juice or in beer foam.

3. At 6 a. m. of the second day begin giving a 2 grain capsule of quinin (preferably bisulphate) with cover taken off, with one-half pint of hot water, every two hours night and day for thirty doses, being absolutely sure not to miss a dose, in order to keep fresh quinin in the blood constantly. It is important to insist on waking the patient at night in order that the intervals shall not exceed two hours at any time.

4. For the following six nights and five days give *absolutely no* quinin, but give a pill containing 1/60 grain of arsenious acid with one-half pint of hot water at 6, 9, 12, 3 and 6 o'clock.

5. Give castor oil as in rule 2 on the evening of the fifth day.

6. At 6 a. m., following the sixth night, again begin to give 2 grains of quinin precisely as under Rule 3.

7. After that give general tonics and simple nourishing food.

8. Avoid reinfection by the use of screens and remaining away from locations where infected mosquitoes abound.

COMMENT

By this plan, persons who were nearly discouraged after living on the plantation for four months, and whose only hope for recovery, according to the local physicians with a life-long experience in the treatment of malaria, was to return to the North, became entirely free from the disease in ten days by the use of one-fourth ounce of quinin, while they had not been benefited by the use of twenty times this amount administered according to the generally accepted plan of treatment. These people remained free from malaria for years on the same plantation, until they were forced to come to the United States because of the revolution.

Hundreds of natives were also cured in the same manner, and it seems as though the general application of this method should free any community of malaria, if a ten days' course of treatment were simultaneously instituted for all infected persons.

It seems, however, that physicians are the least likely portion of the community to apply this method without permitting a flaw in the treatment to creep in, which makes the method as unreliable as the methods which are generally employed and which work so satisfactorily in acute malaria of the two or three day type, but which are useless in the chronic forms.

The errors usually committed lie in:

1. Neglecting to give the quinin with no greater interval than two hours, especially at night.

2. Not emptying the alimentary canal before beginning the course of quinin.

3. Giving quinin in some form during the interval of six nights and five days.

4. Failing to remove the cap of the capsule.

5. Not giving hot water with each dose of quinin.

6. Giving a lot of meat or other albuminous food.

It may seem strange to those who have been accustomed to read my articles on surgical subjects that I should undertake the discussion of this subject. Recently, however, I encountered a condition similar to that which existed in Mexico a few years ago in the beautiful tide water region of Virginia, where a large number of university men have purchased plantations which they are conducting in a scientific way, and where they have been annoyed by this condition. There we have instituted the same plan of treatment that was carried out under my direction in Mexico with such beneficial results that it has seemed to me worth while to give other communities the benefit of my observations.

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THE SIGNIFICANCE OF HIGH PULSE PRESSURE *

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In former papers I have taken up the questions of the point at which diastolic pressure should be read and the significance and importance of the diastolic pressure. The value of the diastolic pressure reading, together with the systolic pressure reading, lies in the determination of pulse pressure. The last named is the real force which drives the blood toward the organs and causes the mass movement of the blood.

As I have stated previously, we consider the normal range of the pulse pressure to be between 30 and 50 mm. of mercury. A pulse pressure under 30 mm. is not often found continuing over a long period of time. This pressure is evidently not enough, as a rule, to send the blood through all the numerous channels and force it back to the right side of the heart. On the contrary, pulse pressures of 100 mm. or over are compatible not only with health, but also with considerable bodily and mental vigor.

The changes which take place in the organs of circulation in order to compensate for these unusual pulse pressures often observed have never to my knowledge received more than passing attention. I believe that we should derive a better understanding of the physiologic pathology of the circulation if we had facts which explained the high pulse pressures which we encounter daily.

A moment's thought will suffice to convince any one that very radical and probably demonstrable anatomic changes take place in the heart and aorta when the pulse pressure increases from 40 to 100 mm. of mercury. Suppose we take Howell's figures for an average left ventricular charge, from 75 to 90 gm. It is believed that the left ventricle empties itself completely at every systole. The aorta at the begining of systole is full of blood, in fact is slightly distended, and by its elastic recoil is forcing the blood forward to the periphery. Into this aorta, in this condition,

* Read before the Milwaukee County Medical Society, Nov. 10, 1916.

are thrown from 75 to 90 gm. of blood in less than half a second under normal conditions. Only one thing can happen. The aorta, chiefly the arch, must be stretched to accommodate this added blood. The anatomic structure of the aorta is such that it can take care of just this sort of influx. The elastic laminae are thick and strong. No muscle is found. There is no need of muscle in this situation.

Again, the normal aorta has considerable of what Meltzer calls "factor of safety." That is to say, after violent exercise the systolic pressure rises rapidly, and the diastolic rises only slightly, so that the pulse pressure, which previously at rest may have been 40, reaches from 65 to 70 mm. of mercury. The pulse rate is also increased, and the volume output is greater. The mass movement is also larger. A greater amount of blood is thrown into the aorta at systole, but the capacity for dilatation which resides in the aorta makes it easily able to take care of the added strain.

For some time I have been engaged in studying the various factors which make up and keep up a high pulse pressure, and I have been able, I believe, to bring together four factors which are correlated and which are found in all high pulse pressure cases. If any one of these factors is present, the other three are found.

1. In all high pulse pressure cases there is increase in the size of the cavity of the left ventricle. The ventricle actually contains more blood when it is full, and throws out, therefore, more blood at each systole. The actual volume output is greater per unit of time. Such hearts always show increase in thickness of the ventricular wall. I quite agree with Stone,[1] who says, "It is merely to be emphasized that when the pulse pressure persistently equals the diastolic pressure [high pressure pulse, in other words] with a resulting 50 per cent. *overload*, which means the expenditure of double the normal amount of kinetic energy on the part of the heart muscle, cardiac hypertrophy has occurred." They are found in aortic insufficiency, in chronic nephritis, in the diffuse fibrous type of arteriosclerosis, and in some cases of exophthalmic goiter. Such a condition occurs temporarily after exercise.

2. In all high pulse pressure cases there is actual permanent increase in diameter of the arch of the aorta. This is a compensating process to accommodate the increased charge from the left ventricle. Smith and Kilgore[2] have shown this to be true in cases of chronic nephritis with hypertension. Their research confirms my own observations. They found dilatation of the arch in (1) syphilis (that is, aortitis); (2) age over 50 (that is, probable factor of arteriosclerosis); (3) other serious cardiac enlargement, and (4) hypertension (with more or less hypertrophy, as in chronic nephritis).

In ten cases showing arches at the upper limit of normal (that is, 6 cm. in diameter) and hypertrophy of the heart, three were chronic mitral endocarditis; one was chronic aortic endocarditis; three were chronic mitral and aortic endocarditis, and there was one each of hyperthyroidism, pericarditis and adherent pericardium.

In fourteen cases of hypertension (highest systolic 270 mm., average systolic, 215 mm.), all showed cardiac hypertrophy. "All but three of these cases had great vessels whose transverse diameters measured over the normal limit of 6 cm., and in one of those measuring 6 cm. the Roentgen-ray diagnosis was 'slight dilatation' of the arch." Smith and Kilgore are at a loss to explain the three exceptions. They did not give diastolic pressures, so pulse pressures are not known. Possibly the three exceptions were cases of high diastolic pressure in which the pulse pressure possibly was not over 60 mm. Such cases might show "slight dilatation of the arch," but not marked dilatation, such as was found in the other, evidently high pulse pressure cases.

In the laboratory of the Milwaukee County Hospital we have confirmed these results. We have found that only the high pulse pressure cases show dilatation of the arch. Certain high tension cases which have had a very high diastolic pressure do not reveal any accurately measurable dilatation of the aortic arch. An empty aorta after death is quite different from a functionating aorta during life. Hence the dilatation which is found postmortem must have been considerable during life. And conversely, a dilatation which was present during life might not be looked on as such after death.

3. In all high pulse pressure cases one will find on careful auscultation over the manubrium, particularly its lower half, breath sounds which vary from bronchial to intensely tubular. At times the percussion note will be slightly impaired, as McCrae[3] has shown in dilatation of the arch of the aorta. This auscultatory sign is evidence of some more or less solid body in the anterior mediastinum which is lying on the trachea and permits the normal tubular breathing in the trachea to be audible over the upper part of the sternum. It is found in cases of dilated aortic arch. Fluoroscopic examination has confirmed the findings on auscultation.

4. In all high pulse pressure cases, in which the pulse pressure is over 70 mm. of mercury, there is increase in the size of all large distributing arteries, carotids, brachials, femorals, renals, celiac axis, etc., with fibrous changes in the media, loss of some of the elasticity, and, in the palpable superficial arteries, increase in size of the pulse wave.

Increased pulse pressure means increased volume output but does not always mean increased velocity. The proper distribution of blood to the various organs of the body is regulated by the vasomotor system acting on the small arteries which contain considerable unstriated muscle. In order that there may be enough blood at all times and under varying conditions of rest and function, there must be a proper supply coming through the distributing vessels, the large arteries, those containing much elastic tissue, and only a very small amount of unstriated muscle tissue or none whatever. Fibrous sclerosis of these vessels causes them to become enlarged and tortuous and to lose much of their elasticity, which is essential for the even distribution of blood. A greater blood volume is therefore necessary in order that the organs may receive their quota of blood. A force which is sufficient to send blood through elastic normal distributing tubes becomes totally insufficient to send the same amount of blood through tortuous and more or less inelastic tubes. As a compensatory process the pulse pressure increases. For this to increase, the left

1. Stone, W. J.: The Differentiation of Cerebral and Cardiac Types of Hyperarterial Tension in Vascular Diseases, Arch. Int. Med., November, 1915, p. 775.

2. Smith, W. H., and Kilgore, A. R.: Dilatation of the Arch of the Aorta in Chronic Nephritis with Hypertension, Am. Jour. Med. Sc., 1915, **149**, 503.

3. McCrae, Thomas: Dilatation of the Arch of the Aorta, Am. Jour. Med. Sc., 1910, **140**, 469.

ventricular cavity dilates, the arch dilates, and as a greater force must be exerted to keep the increased mass in motion, the heart responds by hypertrophy of its left ventricle and becomes itself the subject of fibrous changes in the myocardium. The mass movement of blood is therefore greater in high pulse pressure cases than in cases of normal pulse pressure.

In cases of chronic interstitial nephritis — contracted granular kidney — it may well be that the sclerosis of the arteries is a secondary process caused, as Adami thinks, by the hypertension itself. In aortic insufficiency the situation is somewhat different. The high pulse pressure is due to a very low diastolic pressure, for in my experience with uncomplicated aortic insufficiency the systolic pressure is, as a rule, not much increased above the normal for the individual's age. Here peripheral resistance is so low that a capillary pulse is common. The volume output per unit of time is greatly increased, the arch of the aorta is dilated, and the pulse is large. The fact that a large part of the blood regurgitates during diastole back into the ventricle, and the fact that the diastolic pressure is low means that there is no increased resistance to overcome, and the systolic pressure is not raised.

The opinion expressed in previous publications that the diastolic pressure is the really important part of the blood pressure picture is again emphasized. Particular attention should be directed to the pulse pressure. That measures the actual head of pressure, and careful observations from time to time are of great prognostic value. Again, it is emphasized that high pressure is not a signal of impending dissolution. It must be viewed as a compensatory process, and more attention should be given to changes which appear in the pulse pressure. I feel that we are often recording our blood pressure readings simply as a routine, and that they mean nothing to us. There are still problems to be solved in this field. It is hoped that this small contribution will help to solve some of the questions which arise in the interpretation of a blood pressure picture.

SUMMARY

No blood pressure reading is complete unless both systolic and diastolic pressures are determined.

Pulse pressure is important because it gives the actual driving (kinetic [Stone]) force which keeps the blood in motion and has therefore a great value in prognosis.

High pulse pressure is invariably accompanied by four conditions, some of which can always be determined, and frequently all of which can be found. These are (1) increased size of cavity of left ventricle; (2) definite dilatation of arch of aorta; (3) bronchial or tubular breath sounds heard over the manubrium, and (4) increase in size of all distributing arteries.

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Miasm.—In former days, when there was a widespread belief that epidemics of disease were caused by emanations of foul-smelling gases, the offensive conditions in a highly polluted stream were considered a gross menace to the health of persons in the immediate vicinity. Nowadays it is recognized that foul odors and disgusting appearances, while certainly not conducive to health or happiness, exercise at most an ill defined, probably indirect, influence in the causation of disease; and while the necessity for abating such nuisance is universally recognized, it is for the sake of common decency rather than for prevention of specific diseases.—W. H. Frost, M.D., *Public Health Reports*, Sept. 15, 1916.

MODERN METHODS OF BLOOD TRANSFUSION *

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In the course of the development of the technic of indirect transfusion, a variety of methods have been developed in the last few years. A great number were short lived and did not acquire popularity. Those in use at present are:

1. Syringes. The Lindeman syringe method was lately considerably simplified by Unger,[1] who devised a double way stopcock. With the aid of this stopcock and an ether spray, as suggested by Elsberg,[2] large transfusions can be given with one syringe. In fact, one syringe and an ether spray are a sufficient armamentarium in emergency cases.[3]

2. Glass cylinders, coated with paraffin.[4] Large glass containers (from 250 to 500 c.c.) are used. They are coated with paraffin in order to prevent coagulation. A disadvantage of the method is that the veins of both donor and recipient have to be exposed by a small incision. The coating of the cylinders is not a simple technical procedure.

3. Citrate method.[5] The rationale of this method is that the blood is mixed with an anticoagulant, and the much feared possibility of coagulation during the transfer from donor to recipient thus made impossible.

The idea is by no means a new one. Several attempts have been made in the last century to find an atoxic anticoagulant for blood transfusion. Neudörfer[6] suggested the use of sodium bicarbonate in 1860, and Braxton Hicks[7] tested sodium phosphate with the same object in view in 1869. These experiments were failures, and no further attempts along these lines seem to have been made in the last fifty years.

And yet Neudörfer and Braxton Hicks had the correct idea. Their endeavor to make the blood incoagulable during the transfer from donor to recipient offered a correct working basis. If their work had been taken up by others, the development of the technic of blood transfusion would have traveled on a much more simple route than it has actually done.

When I began animal experiments with sodium citrate with the object of using this drug in human blood transfusion, I did not by any means apply a new drug which had never been used before as an anticoagulant. In fact, sodium citrate was known as the most efficient anticoagulant, and was used extensively in laboratory work. A 1 per cent. mixture of sodium citrate and blood was considered necessary for the prevention of coagulation. Furthermore, it was

* Read by invitation before the Chicago Medical Society, Nov. 15, 1916.

1. Unger, L. J.: A New Method of Syringe Transfusion, The Journal A. M. A., Feb. 13, 1915, p. 582.
2. Elsberg, C. A., reported by Unger, L. J.: Recent Simplifications of the Syringe Method of Transfusion, The Journal A. M. A., Sept. 18, 1915, p. 1029.
3. Lewisohn, Richard: Blood Transfusion with One 20 c.c. Syringe, Am. Jour. Surg., 1915, **29**, 361.
4. Kimpton, A. R., and Brown, J. H.: A New and Simple Method of Transfusion, The Journal A. M. A., July 12, 1913, p. 117. Percy: Simplified Method of Blood Transfusion, Surg., Gynec. and Obst., 1915, **21**, 360.
5. Lewisohn, Richard: A New and Greatly Simplified Method of Blood Transfusion, Med. Rec., New York, 1915, **87**, 141; Blood Transfusion by the Citrate Method, Surg., Gynec. and Obst., 1915, **21**, 37; Citrate Method of Blood Transfusion in Children, Am. Jour. Med. Sc., 1915, **150**, 886; Importance of the Proper Dosage of Sodium Citrate in Blood Transfusion, Ann. Surg., 1916, **64**, 618.
6. Neudörfer: Ueber Transfusionen bei Anaemischen, Oesterr. Ztschr. f. prakt. Heilk., 1860, **6**, 124.
7. Hicks, J. B.: Guy's Hosp. Rep., 1869, **14**, 7.

generally assumed that such a mixture would be toxic when used in the human being.

My experiments were carried out with the object of answering the three following questions:

1. What is the smallest dose of sodium citrate required to keep the blood from clotting?

2. Is sodium citrate atoxic in the amounts required for our purpose?

3. How does sodium citrate affect the coagulation time of the blood?

The results of these experiments were published in extenso in 1915. I shall therefore mention here only my conclusions:

1. Two-tenths per cent. instead of 1 per cent. is the percentage of sodium citrate and blood required for the safe prevention of coagulation. Such a mixture prevents coagulation of the blood outside the body for from two to three days.

2. Five gm. of sodium citrate can be introduced safely into an adult. Larger amounts are extremely toxic. We rarely transfuse more than 1,000 c.c. of blood, which would represent 2 gm. of sodium citrate. However, even a transfusion of 1,500 c.c. of blood would require only 3 gm. of sodium citrate, a perfectly safe dosage.

3. The introduction of citrated blood causes a temporary shortening of the coagulation time of the recipient's blood. The coagulation time returns to its previous level usually in less than twenty-four hours.

Before leaving this subject, I should like to point out how the whole applicability of sodium citrate in human blood transfusion is based on the development of the small dose (0.2 per cent.). This new fact was the most important result of the experiments mentioned above.

The technic of the citrate method can be divided into two separate actions, each of them well known to any practitioner. One is the venipuncture or, in exceptional cases, venesection of the donor's vein; the other is the intravenous infusion of the citrated blood into the recipient.

1. Obtaining the blood from the donor. A tourniquet is applied to the donor's arm, and one of the larger veins in the elbow region (usually the median cephalic vein) is punctured. A cannula of large diameter is used in order that the blood may flow out rapidly through the needle. The blood is collected in a graduated glass jar which contains at its bottom the 2 per cent. citrate solution. If we want to give 450 c.c. of blood, we add 50 c.c. of this solution, thus effecting a 2 per thousand mixture. Smaller and larger amounts of blood are treated proportionately. It is important to take good care that in mixing blood and citrate the proportion is never less than 2 per thousand. In order to prevent such an occurrence it might be advisable to add a few cubic centimeters of surplus citrate solution, which can be done with perfect safety.

2. Infusion of the blood into the recipient. The recipient is usually so anemic that we have to expose the vein by a small incision in about 80 per cent. of the cases. The cannula is inserted, and the latter is attached to a salvarsan apparatus which contains from 20 to 30 c.c. of physiologic sodium chlorid solution. The blood is then poured into this apparatus and allowed to run into the punctured vein by gravitation (exactly like an ordinary saline infusion).

The technic of this method is certainly most simple. It has the further advantage that no special apparatus, not even a syringe, is required for its use. A trocar, a piece of rubber tubing, a glass funnel and a few grams of sodium citrate represent the whole outfit. We often forget that methods should be applicable not only in large, well equipped hospitals, but also in any small village. I think any country practitioner ought to be acquainted with this simple method. Many a life could thus be saved, especially as this method offers the further advantage that the blood can be carried from one place to another. Brem[8] has carried citrated blood 70 miles before he injected it. Burmeister[9] has even gone a step farther and advised the storage of erythrocyte-citrate emulsion for emergency use. There is no doubt that citrated blood can be kept for hours and possibly up to two days, and then injected without harm to the patient. This procedure should, however, be applied only in exceptional cases, as possible hemolysis and other biologic changes in blood so kept do not make it quite as safe and efficient as blood which is transferred from donor to recipient with a short interval.

A Wassermann test must be made in every donor, particularly the professional ones. Furthermore, the blood of the donor and recipient must be tested in order to prevent hemolysis and agglutination. These tests can be done in very few hours and ought to be applied, except in cases of very grave emergency. The opinion has been expressed by different men that these tests are unnecessary. Rather large series of transfusions without tests have been reported, and the absence of any symptoms of hemolysis has been made use of as proof for this contention. This, however, is misleading. It is perfectly feasible to perform twenty transfusions without tests and without serious accident and to have the twenty-first patient die on account of serious incompatibility of the blood of donor and recipient. Such an accident can be avoided easily by proper laboratory tests. Thus to endanger the life of a patient unnecessarily is foolhardiness.

The following important facts ought to be kept in mind in connection with this question: 1. Donors cannot be used a second time for the same patient without another test as to hemolysis and agglutination. 2. Blood relatives (parents and children, brothers, etc.) have to be tested just as thoroughly as strangers, as their blood often is very incompatible in spite of their near blood relationship. Cherry and Langrock[10] have asserted that in new-born infants the mother's blood can always be used with perfect safety for a transfusion. Other workers, however, do not agree with this statement.

Hueter[11] wrote in 1871 in reference to transfusion:

> Too much stress is laid on the technic, as in all operations which are still in the stage of infancy. First a lot of new instruments are invented which are the pride of the inventors, then the technic becomes a minor detail and the indications the main object. Of all the instruments only the simplest are kept.

It has taken over forty years to reach this stage of utmost simplification of the technic of blood transfusion. The technic is now so much simplified that it can be mastered very easily by any physician. We shall have to learn a great deal, however, in reference to indications. Our work in the future along these

8. Brem, W. V.: Blood Transfusion, THE JOURNAL A. M. A., July 15, 1916, p. 190.
9. Burmeister, W. H.: Resuscitation by Means of Preserved Living Erythrocytes in Experimental Illuminating Gas Asphyxia, THE JOURNAL A. M. A., Jan. 15, 1916, p. 164.
10. Cherry, T. H., and Langrock, E. G.: Relation of Hemolysis in the Transfusion of Babies with the Mothers as Donors, THE JOURNAL A. M. A., Feb. 26, 1916, p. 626.
11. Hueter: Arterielle Bluttransfusion, Arch. f. klin. Chir., 1871, 12.

lines will have to put the clinic of blood transfusion on a safe basis. Nobody who has ever seen the revival of a practically pulseless patient by a few hundred cubic centimeters of blood can doubt the marvelous efficiency of blood transfusion. The further development of this interesting field will require the combined efforts of practitioner and serologist. I am sure the results will justify our efforts.

565 Park Avenue.

GASTRIC SYMPTOMS DUE TO IRRITATION IN THE EXTERNAL EAR

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Foreign bodies, including cerumen, may remain indefinitely in the external ear without producing symptoms. If symptoms occur, they are usually local, such as fulness, deafness, tinnitus and pain. Occasionally they cause reflex symptoms, suggesting disease in an organ other than the ear.

Reflex symptoms may be accompanied by symptoms referable to the ear, in which case one's attention is naturally directed to this organ as the probable seat of trouble. If, however, there are no symptoms suggestive of ear disease, it is natural to give all our attention to the distant organ apparently affected.

In textbooks on medicine, no mention is made of the ear as a possible source of gastric disturbances. Books on otology mention, among reflex symptoms caused by foreign bodies in the ear, cases of epilepsy, hemianesthesia and cough, the latter sometimes accompanied by vomiting: but the description is not such as would indicate that the cough or vomiting might dominate the picture and simulate a pure pulmonary or gastric disease.

I have seen several cases of persistent cough, some causing serious concern as to the possibility of pulmonary tuberculosis, due entirely to foreign bodies in the ear. It is with those causing gastric symptoms, however, that this report is concerned. In Treves' "Surgical Applied Anatomy," there is an account of a case similar to the one I shall first describe; otherwise, I have found no reference to this condition in the literature reviewed.

CASE 1.—S. L., girl, aged 12, was referred by her family physician on account of persistent vomiting. From 2 to 4 years of age, she suffered from some digestive disturbance. Since then her health had been good until the beginning of the present trouble. Two years before, supposedly because of worry over her father's illness, she began to vomit. Vomiting occurred immediately after eating. It was independent of the character of the diet, and consisted only of the food last taken. It was sometimes followed by pain in the epigastrium, and was much worse in summer than in winter. The child was undernourished, probably because of inability to retain sufficient food. Complete physical examination, including that of the digestive functions, failed to reveal anything abnormal. In one ear I found a mass which proved to be a glass bead, lightly covered with cerumen, and removal of this gave complete and permanent relief.

CASE 2.—F. H., a waiter in a down town restaurant, had not been sick since an attack of typhoid fever nine years before. He admitted gonorrhea, but denied syphilis. He used very little alcohol and no coffee or tea, but drank much ice water and ate large quantities of fruit. He never suffered from digestive disturbances until two weeks before consulting me. At that time he began to suffer from nausea on arising and was unable to eat much breakfast. The attempt to eat caused some dizziness and a sensation of strangling. There was no pain, but he experienced a sensation of heaviness in the epigastrium. On each of the last four mornings he vomited half an hour after breakfast. The morning nausea would continue until 1 or 2 p. m., after which he could eat a fair lunch and a good evening dinner, having no discomfort during the rest of the day beyond what he described as a heaviness in his head. The history was atypical of any gastric disease, and suggested a reflex origin. Examination showed impacted cerumen in both ears, and immediate relief followed its removal. The patient subsequently told me of having had wax removed several times before, but on no occasion had there been any gastric disturbance.

CASE 3.—E. K., a schoolteacher, aged 21, had some teeth filled several weeks before. The following day she complained of tasting the rubber dam used by the dentist and of being nauseated. On the fourth day she had slight epigastric cramps and vomited once. The pain and nausea were relieved after the vomiting, but in a few hours the nausea returned and continued for the five weeks intervening between this time and the date of her visit to my office. The nausea was not affected by eating. She would get hungry but lose her appetite immediately, especially at sight of the cold lunch she carried with her to school. She had never been constipated before or since the trouble began. Occasionally she had slight burning in the esophagus, which was probably worse after meals, but not regularly so. She had some belching, but no excessive flatus. Urination was more frequent than before the onset of the nausea, but was entirely painless. The history suggested a mild appendicitis, but abdominal examination showed little to confirm this. There was questionable tenderness over McBurney's point, so slight as to cause me to place a question mark in my record while examining her. After prescribing a sedative stomachic, it occurred to me to look at her ears. The left one contained a small amount of cerumen not impinging on the drum. The right ear contained a large plug, completely blocking the canal, and its removal gave immediate relief, which has continued, over a year having elapsed since. Possibly this patient had a mild appendicitis in addition to the impacted cerumen, but it is evident that her symptoms were caused in the main by irritation in the external ear.

CASE 4.—A boy, aged 14, had been vomiting several months, during the greater part of which time he was under medical treatment. When I saw him, at his home in a suburb, he had a temperature of 102, was considerably emaciated, and complained of some vague abdominal pain. He was under the influence of morphin, which the previous attendant had apparently given freely, and the examination was very unsatisfactory. I was unable to make a definite diagnosis, but remember that tuberculosis was uppermost in my mind. I prescribed symptomatically and asked to be notified about the subsequent course. Nothing further was heard until several months later, when he came to my office. The high temperature, probably due to some intercurrent infection, had left him shortly after my visit; but the vomiting continued. A complete physical examination then was made, but nothing found to explain the vomiting until the ears were looked into. One of them was apparently filled with cerumen which, on being washed out, proved to be a peanut. Several days later he reported no improvement, and I heard nothing further from him. A few years later, however, one of his brothers came to consult me and reported that the boy had been in good health ever since, and that I was given credit for his recovery. All attempts to obtain fuller details failed, and the case, incomplete as it is, is included as another probable example illustrating the condition under discussion.

A colleague has kindly given me notes of the case of a girl of 18, with vomiting, especially in the morning, so that pregnancy was suspected. After two weeks of these symptoms, she was relieved by the removal from her ear of the broken end of an apple twig, the bud still attached but long dead. As she recalled afterward, this must have been three months in the ear before producing symptoms.

The anatomic explanation of these cases is as follows:

Where the pneumogastric nerve passes through the jugular foramen, there occurs an enlargement known as the ganglion of the root. To this is attached the accessory portion of the spinal accessory nerve. From the ganglion spring two branches, the meningeal and auricular. The latter, or nerve of Arnold, is joined by a filament from the glossopharyngeal. It then passes through the temporal bone, and emerges at the auricular fissure between the mastoid process and external auditory meatus, and divides into two branches. One communicates with the posterior auricular (branch of the facial), while the other branch supplies the skin at the back part of the auricle and the posterior inferior portion of the external meatus. Irritation of this branch of the vagus, or nerve of Arnold, is the explanation of vomiting having its origin in the external ear.

These cases are not frequent, but probably more so than is suspected, and such a cause should be thought of in cases with gastric symptoms which do not correspond with the usual types of digestive disease.

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THE PRACTICAL USES OF RECENT WORK ON THE INTERNAL EAR

TO THE GENERAL PRACTITIONER, THE OTOLOGIST, OPHTHALMOLOGIST, SYPHILOLOGIST, THE NEUROLOGIST AND SURGEON

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Any work in physiology may be regarded as an "interesting study," but from the standpoint of most of us in the practice of medicine, research work of any kind becomes of greatest importance when it proves useful in clinical work. The cry is, "That is all very interesting, but of what *use* is it? How does it help sick people?" To answer this question is the spirit of this paper. A study of the relation of the ear to the central nervous system not only opens a new field for investigation in physiology, but also furnishes information of diagnostic value in the every-day examination of patients. Although it is essentially and entirely an *ear* study, and is useful in the analysis of ear conditions, yet recent investigations have shown it to be of value in medical and surgical diagnosis. These investigations include a study of patients of the Philadelphia Hospital, eighteen other hospitals in this and other cities, and in private practice, but especially in the department of neuro-otology at the University of Pennsylvania. This work has been made possible by the intimate cooperation of Drs. Mills, Randall, Weisenburg, Lewis Fisher and Seth A. Brumm.

It is now recognized that the internal ear, instead of being one organ, consists of two organs of different functions — the cochlea, which is the organ of hearing, and the static labyrinth, which is the organ of equilibration. It seems remarkable that whereas the cochlea has long been recognized as the organ of hearing, the static portion of the ear, consisting of the utricle, saccule and three semicircular canals, has been through all the years a *terra incognita*. It is only in the past few years that the function of the static labyrinth has been carefully studied, preeminently by the Vienna group of otologists, to whom we are indebted for the new methods of testing the internal ear. Robert Bárány has recently received the Nobel prize for this work, and he is to be regarded as the pioneer in the clinical application of the study of the ear and the central nervous system.

THE TESTS

The semicircular canals may be stimulated by revolving a person in a turning-chair, or by douching the ears with either cold or hot water, or by applying the galvanic current to the ear. According to our experience, the turning and douching are much more useful than the electrical test. The galvanic current stimulates equally all portions of the internal ear and, in fact, the eighth nerve itself. As we regard it of greatest importance to analyze the function of the canals separately, we shall consider in this paper only the tests by turning and douching. The essential feature in the physiology of these tests is that the endolymph within the particular canal or canals stimulated is set in motion on the one hand mechanically by the turning, and on the other hand thermically by the douching. When a person is turned to the right, the endolymph catches up to the movement of the body; and when the turning-chair is stopped, the endolymph continues to move to the right by its own momentum. The physiology of the caloric test may be illustrated by the "thermosyphon" system of some of the popular automobiles. They have no water-pump to force a circulation through the radiator; the engine heats the water, decreasing its specific gravity, and causing it to move upward and forward into the radiator, where it is cooled, drops to the bottom of the radiator, and continues downward and backward into the engine, thus completing the circuit. Similarly chilling the outer portion of a semicircular canal increases the density of the endolymph at this point and produces a circulation downward.

Such ear stimulation produces certain definite phenomena in normal persons — a rhythmic jerking of the eyes known as nystagmus and a subjective sensation of turning which may be termed a systematized vertigo. The eyes are always drawn in the direction of the endolymph movement and are then quickly jerked back in the opposite direction by impulses from the cerebrum. The subjective sensation of vertigo is always in a direction opposite to the endolymph movement. According to our conviction there are only two reactions produced by ear stimulation — vertigo and nystagmus; it is *because* of this vertigo that the person falls in a definite direction, and also, when he attempts to find with his finger an object he has previously touched, he is unable to find it but past-points to the right or left, above or below, depending on the direction and plane of his sensation of vertigo.

It is evident that if stimulation of the ear causes a movement of the eyes, there must be a definite nerve pathway from the ear to the eye muscles. Also if ear stimulation produces dizziness, it is evident there must be a nerve pathway from the ear to the cerebral cortex. The special object of our work has been the attempt to determine the pathways through the brain from the ear. On the basis of over 350 pathologic cases, including a considerable number of operations and necropsies, we have come to certain conclusions as to the course of the fibers from the ear through the brain-stem, cerebellum and cerebrum. In brief, our conclusions are as follows:

The fibers from the horizontal semicircular canals pass through the eighth nerve to the brain-stem, and enter Deiters' nucleus in the medulla oblongata. At this nucleus the fibers divide, going on the one hand to the posterior longitudinal bundle, through which they are connected with the various eye muscle nuclei, to be distributed through the third, fourth and sixth nerves to the eye muscles themselves. It is this pathway that is responsible for the eye movement. The other pathway goes from Deiters' nucleus through the inferior cerebellar peduncle to the cerebellar nuclei of the same side, from which it proceeds through the right superior cerebellar peduncle to the decussation of the two superior cerebellar peduncles in the base of the cerebral crura; from this point there are two pathways to the cerebral cortex of both sides, but the main pathway goes to the cortex of the opposite side. The cortical centers that receive these fibers are postulated by Mills to be in the posterior portion of the second temporal convolutions adjacent to the cortical areas for hearing. It is this pathway from the horizontal canal to the cerebral cortex, passing through the cerebellum, that is responsible for the production of vertigo on ear stimulation. The fibers from the vertical semicircular canals have a different pathway after entering the brain-stem, ascending in the pons to a point above the middle of the pons. At this point the fibers divide, on the one hand going to the posterior longitudinal bundle, to be distributed to the eye muscles; on the other hand the fibers enter the cerebellar nuclei through the *middle* cerebellar peduncle, from which point their pathway is the same as that of the fibers from the horizontal canal. In a nutshell, by the *vestibular apparatus* we mean the static portions of the internal ears, and the pathways from the ears through the brain-stem, cerebellum and cerebrum.

IMPORTANCE OF THESE TESTS IN DIAGNOSIS

1. *Value to the General Practitioner.*—The general practitioner is constantly confronted with cases of "vertigo." It is surely not overstating the fact to say that at best he can only guess as to its significance. In the light of these new tests, vertigo should no longer be regarded as a vague and general symptom. We should never speak of gastric vertigo, kidney vertigo, cardiovascular vertigo, idiopathic vertigo, or any other generalization which in its ultimate analysis means nothing. Vertigo is definitely a disturbance of the equilibratory apparatus. These tests give us the means of analyzing this apparatus. All conscious sensations are cerebral; headache from whatever cause is a disturbance in the brain. Similarly vertigo is due to an irritation, impairment or destruction of some portion or portions of the ear or its associated pathways. Therefore, just as we examine the urine in suspected cases of nephritis or diabetes, or as we have a Wassermann test made in suspected cases of syphilis, just so these ear tests enable us to analyze the apparatus responsible for dizziness. Instead of guessing, we then know the reason for the vertigo. We do not hesitate to say that it is very rare that a "dizzy" case remains obscure after these ear tests, and in most instances the diagnosis becomes clear and simple. After these tests are made we are able to say, for example, that the patient is dizzy because of a toxic impairment of his labyrinth, a labyrinthitis, an organic lesion in some part of the vestibular tract such as is produced, for example, by a brain tumor, internal hydrocephalus or multiple sclerosis; or, in the presence of normal reactions, we can state with assurance that the vertigo is purely functional.

2. *Value to the Otologist.*—It is surprising how much information can be obtained by these tests in the ordinary every-day study of an ear case. Briefly, from the ear standpoint alone, we have by means of the turning and douching tests produced nystagmus, vertigo, past-pointing and falling, the clean-cut quantitative objective evidence of the function of each part of the static portion of the labyrinth and eighth nerve. A patient complains of deafness; the question arises, Is it a middle ear or an internal ear condition? These hard and fast reactions give positive data of the function of the internal ear; then a positive opinion can be given with less reservation. Institutions for the deaf and dumb obviously should have a turning-chair: in these poor unfortunates the functional tests of hearing are so often unsatisfactory that we never feel after making the hearing tests that we are sure the labyrinth is completely destroyed. It is just here that the new tests are valuable; they either do or do not give reactions. The answer is "yes" or "no." In routine examination, it is of course not necessary to conduct all the tests; merely by turning the patient and obtaining twenty-six seconds of after-turning nystagmus, we at once can conclude that both static labyrinths are normal. Very often, however, the nystagmus will be subnormal, and immediately we have a hint as to the necessity for further study. We have no hesitancy in suggesting that if the otologist in his routine work will make such a simple test, he will be surprised to find that in many instances an entirely new light is thrown on the condition of his patient.

3. *Value to the Ophthalmologist.*—The attention of the eye specialist has not been called to the intimate relation between the ear and the eye. He should surely know that a nystagmus of any type and in any direction can be produced "to order" by ear stimulation. There is an absolute and definite relation between the canal stimulated and the type of nystagmus produced. If we wish to produce a vertical nystagmus upward, we place the patient's head over toward the right shoulder, turn him to the left, and there appears a vertical nystagmus upward. If we wish a rotary nystagmus to the left, we douche the right ear with head upright with cold water, or douche the left ear with hot water, and there is produced a rotary nystagmus to the left. Although space does not permit discussing the reasons for this marvelously accurate ear-to-eye mechanism, the foregoing gives some idea of the fixed relationship between the semicircular canals and the eye muscles. The "fistula" test serves as an illustration: If there is caries of bone in the outer wall of the labyrinth producing a fistula into the internal ear, or for that matter if the stapes is unduly mobile in the oval window, applying a Politzer bag into the ear and causing pressure or suction cause the eyes to dance violently. Recently a well known ophthalmologist, on seeing us do this test, expressed his astonishment: "I had no idea there is such a close relation between the ear and the eye."

The Practical Application of These Tests: (*a*) In the study of eye-muscle palsy. For example, loss of conjugate deviation in various directions should always be studied by means of the ear tests. There is a loss of voluntary control; the patient is unable, when asked, to look in a given direction. If the ear stimulus causes the eyes to move in this direction, it shows without

question that there are normal pathways from the ear through the eye-muscle nuclei and through the nerves to the eye muscles themselves — therefore, the lesion is supranuclear.

(*b*) Spontaneous nystagmus may be ocular in origin from corneal scars, macular lesions, or eye strain, as in miners, in which case the cause is easily determined by proper ocular examination. But what of those cases in which the lesion lies not so near the surface? It is in such cases that the ear tests are essential. Recently there were two babies, both showing a wild oscillatory nystagmus. Naturally it was the ophthalmologist who was called on to determine its cause; he found nothing wrong in the eyes themselves to account for the nystagmus. The ear tests, however, showed a striking difference between the two cases. On one we reported, "The ear tests suggest an irritation of the vestibulo-ocular tract, but no organic impairment; the prognosis is good." The child had a perfect recovery. The report on the other patient was, "There is an organic block of the vestibulo-ocular tracts of both sides in the brain stem; the prognosis is bad." This patient died. The reason for this report was, that the first patient, on ear stimulation, immediately showed a change of the oscillatory nystagmus into a definite rhythmic pull. The ear stimulation, as it were, seized both eyes and caused them to move rhythmically in the proper direction; evidently, therefore, there was no organic block of the pathways. The other patient continued to have the oscillatory nystagmus and was entirely unaffected by ear stimulation, showing a definite organic block of the pathways from both ears to the eyes.

4. *Value to the Syphilologist.*—Syphilis is such a prevalent affection that any method of diagnosis deserves thorough investigation. The disease manifests itself in so many forms that although it is comparatively easy to diagnose in certain cases, yet it is extremely difficult in others. There is probably no other disease in which early diagnosis is so important; if detected early, certain well known remedies can often effect a prompt and permanent cure. Prognosis, in fact, depends largely on how quickly the treatment is instituted. Discovery of the Wassermann test was justly hailed as an extraordinary aid to the clinician, but unfortunately the Wassermann reaction is not absolute; it is common experience to find patients who are clinically undoubtedly syphilitic, and who also improve under antisyphilitic treatment, but whose reactions to the Wassermann test are repeatedly negative. Our investigations to date have led us to believe that:

(*a*) The new ear tests may prove useful in the early diagnosis of syphilis. Many cases referred to us show a beginning very slight but unmistakable impairment of eighth nerve function, only a few weeks after the primary infection; had it not been for the delicacy of the new tests we should probably have not been able to detect this impairment for months.

(*b*) Ear examinations unquestionably are valuable in detecting a beginning involvement of the central nervous system. It is recognized that the nervous system is attacked in 5 per cent. of those infected; we venture to suggest that probably this percentage is much higher and that many cases are not recognized because there is no obvious involvement, as in locomotor ataxia, facial paralysis or general paresis. The eighth nerve is particularly vulnerable to this disease, and analysis of the function of the eighth nerve and the intracranial pathways from the eighth nerve may in certain cases demonstrate a beginning involvement of the nervous system several years before it can be detected by any other method.

5. *Value to the Neurologist.*—Naturally all the subjects already mentioned are of interest to the neurologist; the determining of the cause of vertigo, the degree of function of the eighth nerve and labyrinth, the study of eye-muscle palsies, the analysis of spontaneous nystagmus, and the early diagnosis of syphilis of the central nervous system. In addition, the neurologist has in these tests a very definite help in:

(*a*) Differential diagnosis between labyrinth and intracranial lesions. The ear tests are indispensable for such differentiation. In many instances the symptoms of internal ear disturbances and of cerebellar lesions are identical. To illustrate: A patient was diagnosed neurologically as having a lesion of the right cerebellar hemisphere; ear tests gave additional data to the neurologist and demonstrated conclusively that it was a lesion of the right labyrinth.

(*b*) Intracranial localization. The accuracy of the ear tests has been surprising in locating lesions in the cerebellopontile angle, medulla oblongata, pons, cerebellar peduncles, cerebellum and various portions of the cerebrum, including the parietal lobe, temporal lobe and occipital lobe. Neurologists invariably want an eye examination in intracranial cases. We as otologists are not in a position to state the relative values, but the neurologists and ophthalmologists most acquainted with these ear tests assert that, of the two methods of approach, much more definite information can be had from the ear tests than from the eye examination.

6. *Value to the Surgeon.*—Perhaps no phase of surgery is so difficult in diagnosis as intracranial localization. It is a sad commentary on intracranial surgery that in a large majority of cases the surgeon must content himself merely with a palliative decompression. The ear tests have proved of real value in the locating of lesions; but in addition they may prove helpful to the surgeon in preventing unnecessary operations. This may be illustrated by the following two cases:

A woman appeared to have a tumor of the right cerebellar hemisphere. This diagnosis was confirmed by neurologic consultants, and the Roentgen-ray report stated that it was a cyst in the right cerebellar hemisphere. The surgeon was about to operate, but hesitated because the ear report said it was a lesion of the right labyrinth, and that the cerebellum appeared intact. The woman had a perfect recovery without operation, has given birth to a baby, and has remained in perfect health ever since—two years.

Another woman was operated on for carcinoma of the gallbladder. The findings were negative. Subsequent ear examination made it perfectly simple that all her symptoms—nausea, vomiting, diarrhea and consequent emaciation—had been due entirely to recurring attacks of labyrinthitis. She made an excellent recovery.

In the opinion of the surgeons best acquainted with this work, no brain should be opened without giving the patient the benefit of the ear tests.

CONCLUSION

It must be remembered that the work of the ear specialist along the lines of the relation of the ear to medical and surgical diagnosis is only in its infancy. This paper is intended not so much to call attention to what we have done as to hint at the future possibilities of this study and to indicate how the cooperation of the otologist with those in other branches of medical work can "help sick people."

1831 Chestnut Street.

ZINC CHLORID IN UTERINE HEMORRHAGE

PARTICULARLY WHEN CAUSED BY UTERINE MYOMAS AND METRO-ENDOMETRITIS OR FIBROSIS UTERI *

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Among the therapeutic agents which have been used successfully to combat uterine bleeding caused by myomas and chronic metro-endometritis, or, as this is frequently called, fibrosis uteri, the most prominent are roentgenotherapy and radium. In cases of profuse bleeding, however, a surgical intervention is frequently resorted to and the uterus extirpated.

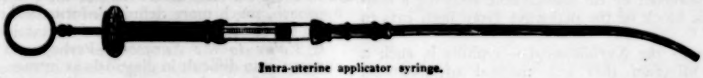
While I advocate surgical intervention in the greater number of fibromyomas, I do not approve of so radical a measure if the uterus is not the seat of neoplasm. Then, too, there are patients who will not submit to a surgical operation. And it is from such patients that I have acquired my experience.

At the New Orleans meeting of this society in 1907 I spoke of the good results obtained in instances of endometritis with menorrhagia from the intra-uterine use of phenol (carbolic acid), and in some instances, when the bleeding was very profuse and the phenol was ineffectual, from the intra-uterine application of zinc chlorid.

Since that time my experience has been greatly increased, and because I have found this form of therapy so very satisfactory, I take the liberty once more of calling attention to it, regardless of the fact that some of our younger brethren may feel inclined to denominate it as "tinkering therapy."

Dr. Marion Sims, who did so much to establish gynecology as a recognized specialty, and other leading gynecologists, as well, made use of zinc chlorid to control bleeding in instances of inoperable cancer of the cervix, and proved it a valuable remedy in properly selected cases. In those days, before I utilized the galvanocautery, brought into extensive use by Dr. John Byrne of Brooklyn, I, too, used zinc chlorid in a number of cases, but discarded it not only because of inability to limit its action, but also because sometimes a vesicovaginal, or even a rectovesicovaginal fistula resulted, in my experience, if the cancer had advanced too far.

It seemed too radical, in my opinion, to subject a patient who had very profuse bleeding, in the form either of menorrhagia or of metrorrhagia, the uterus not being the seat of a neoplasm, to an extirpation of the uterus. I, therefore, commenced to experiment with varying strengths of phenol applied within the uterus. In mild cases this sometimes gave a good result. Then I began to make my applications of longer duration by leaving a gauze strip — a tampon saturated with the medicament in that part of the gauze which was to remain in contact with the corporal endometrium. This is done by wrapping an intra-uterine applicator syringe, such as is made according to my directions by the Kny-Scheerer Company and by Tiemann & Co.[1] The medicament is drawn into the small barrel of the syringe, and this is wrapped with a narrow strip of gauze. The cannula of the syringe is made of silver, from 4 to 5 inches long, with only a terminal opening, so that the medicament comes into contact with the endometrium from the fundus downward. To allow of the gauze being readily slipped off, the cannula should be smeared with petrolatum before the wrapping. The strip should be from 1 to 2 inches wide, and the length should vary with the size of the uterine cavity, usually from 12 to 24 inches. When the gauze-wrapped cannula has been introduced into the uterine cavity, a small quantity of the medicament, 4 or 5 drops (if zinc chlorid), is expelled into the gauze. Then the cannula is withdrawn slightly and, being used as a uterine packer, more gauze is put into the uterine cavity and more of the medicament is ejected. This process is continued until the desired quantity has been ejected into the gauze and the cavity packed properly. When enough medicament has been put into the gauze, the cannula may be entirely withdrawn and the remaining part of the gauze packed into the uterine cavity with an ordinary smooth uterine applicator. It is essential that none of the medicament should come in contact with the cervical mucosa, especially if zinc chlorid is used, lest a stricture result. The remaining part of the nonmedicated gauze strip is then used to pack tightly the cervical canal. It is frequently necessary to dilate the cervical canal with a cervical dilator to assure a ready packing with the gauze.



Intra-uterine applicator syringe.

A string should be attached to the terminal part of the gauze strip to enable the patient to remove it herself at the time designated for its removal. A fairly large absorbent cotton tampon is placed in the vagina after insertion of the gauze. The time of removal of the intra-uterine tampon depends on whether zinc chlorid or phenol has been used. If phenol, either pure or diluted with glycerin, is the medicament, the gauze strip may be removed after the lapse of a few hours. But if zinc chlorid, the time to elapse must be long enough to give it an opportunity to exert its action on the interior of the uterus, which is about three days. In case of severe abdominal pain, which may occasionally occur, one-fourth grain of morphin is sufficient to give relief. It is very important, to insure proper action of the medicament, that the interior of the uterus is practically dry; that is, that no bleeding from it occurs when the application is made. When there is bloody oozing, the packing of the cavity with styptic gauze for a variable time is the best method to overcome it.

Unless permanent amenorrhea is desired, not more than from 5 to 10 drops of the strong solution (50 per cent.), or a somewhat larger quantity of a 10 to 20 per cent. solution should be used.

It has been found that one application of zinc chlorid, if properly made, once in four weeks, usually suffices. This is to be repeated, at such intervals, until the wished-for result has been brought about. From four to twelve applications generally suffice. With

* Read before the Southern Surgical and Gynecological Society, White Sulphur Springs, W. Va., Dec. 11, 1916.

1. The applicator syringe differs from the well known Braun uterine syringe in that the cannula is thinner, because of the gauze to be wrapped around it, it is made of silver, it has only one terminal opening, and it is somewhat larger.

twelve applications, or even a lesser number, it has been found possible to effect complete amenorrhea in very profuse bleeding from interstitial myomas. Some of these tumors, in my experience, were fully 6 inches in diameter. While they did not decrease in size, the symptoms disappeared and the patients improved in health. Since the bleeding stopped, this was logical.

Zinc chlorid is made use of when the uterine bleeding is very profuse from a chronic inflammatory condition of the endometrium, whether the myometrium is involved or not. If the bleeding is not too profuse or too prolonged, phenol suffices to bring about relief. Zinc chlorid is always used in instances of profuse bleeding when interstitial myomas of small size cause it. In large tumors of this character I have not used it, nor would I advise its use, because, in such cases, I feel that it is more to the interest of the patient, if one does not wish to use radium or roentgenotherapy, to remove the tumor. By the latter statement I do not wish to be understood as favoring roentgenotherapy in these conditions, since I myself have seen instances of cancer complicating the tumor.

It is understood, of course, that one should always be sure, before using such treatment, that the bleeding is not caused by a malignant change of the endometrium.

This is a form of treatment which may be used in his office by any intelligent physician who understands gynecologic diagnosis; even the sometimes necessary cervical dilatation, to introduce the gauze-wrapped cannula, may be done. Seldom have I found it necessary to do this, under gas-oxygen anesthesia, in a hospital.

39 East Sixty-First Street.

Fig. 1.—Enterostomy. Purse-string suture introduced, cautery making opening into bowel.

Some Facts About the Soya Bean.—The soya bean provides oil and food. In order to get as much as possible of the oil out of the meal the pressed pulp is sometimes further extracted by means of a solvent which will dissolve out the oil remaining after the beans have been pressed. Naphtha is good enough, but care must be taken to remove it entirely from the meal. Cattle do not take to the smell of naphtha, although they thrive on the new fodder when it has been thoroughly removed. Tri-chlor-ethylene is another good solvent for soya bean oil; it is not offensive in odor and it is not poisonous when given to cattle in comparatively large doses. Neither is it inflammable or explosive. Offhand it would appear that tri-chlor-ethylene is better and safer in every way than naphtha, but when it has been used as a solvent for the oil in the pressed meal or cake a considerable number of cattle have died from eating it. Since the cake is good feed for cattle and the tri-chlor-ethylene is not poisonous, something must happen, probably a chemical reaction between these two harmless bodies which produces a poison. It is not yet known what the reaction is.

ENTEROSTOMY; A PERFECTED TECHNIC *

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For the purpose of illustrating the technic herein offered, I may describe a case of intestinal obstruction following abdominal section. By the second, third or fourth day the bowels have not been moved, nor has flatus passed. There are increasing tympany, muscular rigidity and abdominal tenderness. Acute dilatation of the stomach develops, with excessive thirst and frequent vomiting of stomach and duodenal contents. The stomach tube gives only temporary relief. The patient is restless, anxious and evidently losing ground. Auscultation of the abdomen reveals intestinal metallic gurgling sounds due to paroxysmal waves of peristalsis occurring at frequent intervals. The peristalsis forces the liquid and gaseous contents of the bowel to the point of obstruction and produces much pain. Urinalysis reveals albumin, casts and indican in increasing quantities.

No wise surgeon gives purgatives under such circumstances. Enemas of every kind have been tried and failed. The patient's condition is getting d e s p e r a t e. Something must be done and that quickly. Often by this time not only the patient but the family as well have become demoralized. The thought of another operation only adds to the confusion. It is in cases of this kind that enterostomy offers the greatest relief.

If circumstances will permit, the patient should be gently removed to the operating r o o m, where any measure can more conveniently be carried out. An enterostomy, however, can be done without moving the patient from the bed. With the judicious use of a local anesthetic and the persuasive words of the tactful surgeon, the entire operation may be carried out without producing either pain or fright.

Under the plea of "dressing the wound," a few stitches are removed and the edges of the incision gently separated. When the peritoneum is opened one should not search for the point of obstruction, unless it can easily be reached, but content oneself by dealing with the first distended coil of intestine which presents itself. The emphasis is on *distended,* since it is worse than useless to puncture the bowel below

* Read before the Southern Surgical and Gynecological Association, White Sulphur Springs, W. Va., Dec. 12, 1916.

the obstruction. When the obstruction is purely mechanical and no sepsis is present, more freedom is allowable. Without disturbing the parts unduly a purse-string suture, preferably of chromic gut, is placed into the bowel wall. The needle should be introduced rather deeply. An area a good half inch in diameter is included (Fig. 1). By catching the suture at two equidistant points with forceps and the untied ends between the fingers, sufficient tension can be maintained to serve the double purpose of steadying the parts and reduce the soiling of the field to a minimum.

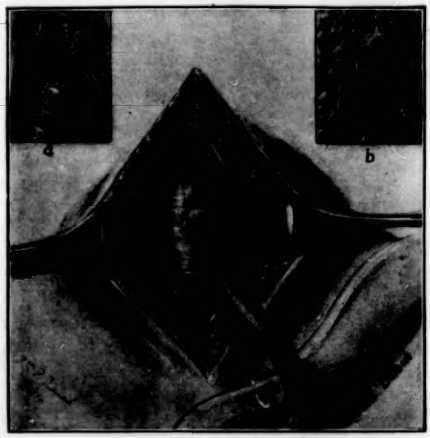

Fig. 2.—Enterostomy. Drainage tube in the intestine, purse-string suture tied. Inset *a* shows tube in bowel and two purse-string sutures applied. Inset *b* shows omentum which has been perforated and the tube drawn through it; two superficial catgut sutures hold the omentum snugly about the tube and intestinal fistula.

While the suture is being held as indicated in the illustration, the pencil point of a thermocautery is made to slowly burn a hole into the intestine. The cautery is preferable to the knife or scissors for several good reasons: 1. A burnt wound does not bleed, while a stab wound into the intestine occasionally severs a small vessel which requires ligating. 2. A perforation made by burning tends to contract rather than to get larger, which is an important consideration when dealing with an intestinal fistula. 3. The heat seals the various coats of the intestine together so that the edges do not separate or retract. 4. There is a notable absence of eversion of the mucosa which is seen in stab and pistol shot wounds of the intestine.

Before the perforation is made, the enterostomy tube should be prepared and near at hand, so that as the cautery point is withdrawn the tube may be immediately introduced and thus the escape of intestinal contents be avoided. The tube is preferably one of fairly soft rubber which will not collapse. It should be smooth and without enlargement of any kind. A tube twice the size of the opening can be easily introduced, since the bowel wall is sufficiently elastic. This disproportion between the size of the tube and the fistula causes the rim to hug the tube closely, which prevents leaking.

The forceps are now removed from the suture and the ends tied. With a little care the inversion of the edge of the perforation is easily effected (Fig. 2). If the condition of the intestinal wall will permit, a second purse-string suture adds to the security and increases the inversion, which favors the subsequent healing of the fistula by bringing a wider margin of serosa to serosa (Fig. 2, Insert *a*).

Whenever it is possible to do so, the omentum should be drawn about the tube and, if need be, stitched in place by one or two fine plain catgut sutures. A good plan is to puncture the omentum and pass the distal end of the tube through it (Fig. 2, Insert *b*). Utilization of the omentum with which to safeguard the intestinal opening both before and after the tube has been withdrawn cannot be too strongly emphasized.

Formerly I stitched the tubing to the intestine in order to secure it in place; but this is a mistake, since the suture from tube to intestine is liable to cut out of the intestine and increase the size of the opening. Besides, when the tube is subsequently removed, the anchor suture disturbs the inversion, greatly interfering with the healing. The tube is best secured by narrow strips of adhesive plaster to the skin (Fig. 3).

Unless the abdominal cavity is already shut off from the field of operation by adhesions, the open portion of the wound should be filled with fluffy gauze. The gauze will protect the peritoneum and promote the formation of adhesions.

When the perforation has been done with the cautery, the edges properly inverted, and the parts surrounded by omentum, the fistula usually heals of itself promptly. I have seen fistulas which did not leak a drop either before or following the removal of the tube. While there is no operation more serviceable than an enterostomy when indicated, there can be nothing more annoying than a fecal fistula which will not heal. The technic herein described reaps the benefits of the one and avoids in a large percentage of cases the evil effects of the other.

Fig. 3.—Enterostomy. Operation finished, rubber tube in situ and held in place by two narrow adhesive strips, the upper and lower end of the incision sutured. The portion of the wound about the tube is filled with fluffy gauze which prevents protrusion of the intestines and promotes adhesions.

This method of doing enterostomy can be safely accepted as the standard. Also it may be said that, like the singing of the southern mocking bird, one of its chief beauties is the variations to which its technic is susceptible, and that, too, without departing from the principles involved in its standardization.

For instance, the use of the appendix through which to insert a catheter for drainage is only a refined

method of doing enterostomy. Under certain circumstances, it is not necessary to use a purse-string or, indeed, a suture of any kind. Occasionally, after the distended bowel is emptied, its walls are so flaccid as to allow of an inch or two of the drainage tube being covered by suturing the bowel over it as in a Witzel gastrostomy. This, however, is not often advisable, especially if the omentum cannot be utilized. Securing the fistulous area to the parietal peritoneum by a continuous suture after the manner of Kocher is not advisable unless a permanent fistula is desired. If it is thought expedient, the bowel may be anchored to the peritoneum with from two to four interrupted sutures. Should it not be practicable to open the abdomen through the former incision, it is easy enough to make an independent incision under local anesthesia. Other variations might be mentioned, but it is sufficient to say that a standardized technic once understood and approved can be easily adapted to meet the conditions found.

TRINITROTOLUENE POISONING

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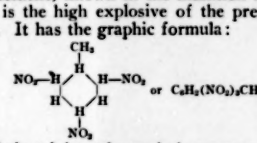
Trinitrotoluene, known in the munition industry as T. N. T., is the high explosive of the present European War. It has the graphic formula:



or $C_6H_2(NO_2)_3CH_3$

To explode trinitrotoluene it is necessary to bring it up to a certain heat and then produce concussion. Heat alone causes it to burn like gum camphor; concussion alone will not explode it. A shell filled with trinitrotoluene is usually exploded by placing in the nose of the shell a detonator containing another high explosive, such as fulminate of mercury.

In the manufacture of trinitrotoluene there is little danger of industrial poisoning, since the procedure takes place in closed retorts, etc., with consequently no exposure of the workmen to the fumes. In the filling of high explosive shells it is necessary to heat the flaked trinitrotoluene above its melting point, to about 94 C., and after letting it cool slightly to pour the molten resin-like substance into the steel shell and then allow it to solidify. It is during these procedures that the workmen are exposed to the heavy fumes emitted from the hot trinitrotoluene. (It has been shown that the vapor emitted from molten trinitrotoluene consists of a considerable amount of escaping trinitrotoluene. When the vapor strikes any surface having a lower temperature than 70 C., trinitrotoluene is deposited in the for... of a fine crystalline sublimate. There is a definite scientific basis, therefore, for the supposition that poisoning can take place by inhalation of fumes emitted from molten trinitrotoluene.) It is afterward necessary to chip and scrape off the solidified explosive which has collected around the top of the shell. An accurate core must also be drilled into the solidified trinitrotoluene to make room for the detonator. During these processes, especially if proper protective machinery is not in use, the workmen are exposed to the yellow dust.

It is probable that trinitrotoluene poisoning has been known in Germany for some time. Reports of it, however, have not been made public. There has been little about it in the French or English literature until quite recently.

In 1915, in England, a committee was appointed under the chairmanship of Sir George Newman to make a report to the Ministry of Munitions on industrial diseases occurring in munition factories and workshops. In a part of their report, Memorandum VIII, the symptoms of trinitrotoluene poisoning are described, and measures for minimizing the risks are outlined.

In the early part of 1916, Spilsbury[1] demonstrated four livers presenting the following types of toxic hepatitis:

1. *Tetrachlorethane Poisoning.* — Tetrachlorethane is used to dissolve acetic cellulose in preparing a waterproof varnish for coating the wings of aeroplanes; it has been the cause of several fatal industrial poisonings in aeroplane factories, and the poisoning is commonly known as "dope" poisoning.

The liver showed irregular fibrosis and cellular destruction, with marked regeneration in one part and almost complete absence of fat.

2. *Dinitrobenzene Poisoning.* — The liver showed irregular fibrosis, little degeneration of cells, much bile duct proliferation and no fat. This was obviously an example of a chronic form of toxic hepatitis.

3. *Trinitrotoluene Poisoning.* — The liver showed marked reduction in size, irregular fibrosis and advanced fatty degeneration.

4. *Acute Yellow Atrophy.*—The liver was characterized particularly by absence of fat in the liver cells and marked fatty degeneration of the endothelial cells.

In August, 1916, Drs. Livingstone-Learmonth and Cunningham[2] described the symptoms and treatment of trinitrotoluene poisoning among women workers in some of the large munition plants in England. This is the first comprehensive description that I know of. The symptoms are mainly due to the inhalation and ingestion of trinitrotoluene dust. Exposure to the fumes alone might give the same effects, with the exception, however, that the irritating effects on the respiratory tract would be less. The symptoms observed were divided into irritative effects due to action of the poison on the skin and mucous membranes, and toxic symptoms due to degenerative hepatitis. The former include nasal irritation with occasional epistaxis, lacrimation and smarting of the eyes, a sensation of constriction in the throat, and dry cough with yellow, bitter sputum. Patients complained of a bitter taste in the mouth, of spasmodic gripping pains in the abdomen, of acid eructations and often of vomiting. Early in the intoxication there was obstinate constipation followed by diarrhea with tenesmus. The skin showed rashes of a cheiropompholix or eczematous type over the face and extremities, most prominent where sweating was greatest. The toxic symptoms included nausea, vomiting, anorexia, jaundice, mental depression, blurred vision, and transient peripheral neuritis. The poisoning often terminated in delirium, sometimes with coma or with convulsions.

More recently, the British Ministry of Munitions has published a concise summary of trinitrotoluene poison-

1. Spilsbury, B. H.: Demonstration of a Series of Livers Affected by Toxic Hepatitis, Lancet, London, 1916, **1**, 999.

2. Livingstone-Learmonth, Agnes, and Cunningham, Barbara M.: The Effects of Trinitrotoluene on Women Workers, Lancet, London, 1916, **2**, 261.

ing, covering the symptoms, prevalence and preventive measures.[3] The communication states that before August, 1914, there had been little practical experience of the toxic action of trinitrotoluene in England. During the past year there have been fifty cases of fatal toxic jaundice reported out of many thousands of workers engaged, proving that trinitrotoluene is dangerous to a small minority of workers coming in contact with it. Attention is called to a urinary test for detecting trinitrotoluene, which is of great value in the early diagnosis of cases. As regards the importance of predisposition, the communication says:

> It would appear as though workers could be divided into two classes—the one (and much larger) insusceptible and remaining so, however much exposed; the other susceptible and liable to develop jaundice between the fifth and fifteenth week of their employment.

The duration of employment before the appearance of jaundice showed a remarkable uniformity. In 83 per cent. of the cases jaundice appeared between the fifth and sixteenth weeks of employment. In 105 reports on toxic jaundice not one patient had been employed for a period of less than four weeks. Only two fatal cases have been reported in which the worker had been employed more than four months. For the development of toxic jaundice in the susceptible, the exposure often needs to be only a slight one. A great number of cases occurred in persons below 18 years and over 50 years of age. Of the two cases of trinitrotoluene poisoning resulting in death, reported below, the first illustrates the common type of poisoning in which death results from hepatic failure due to an intense toxic hepatitis with extreme necrosis and autolysis of liver parenchyma associated with icterus. The second represents an unusual type of poisoning in which death results from an acute aplastic anemia without presenting evidence of toxic hepatitis or icterus.

The first case, I am informed by Alice Hamilton,[4] was the first fatal case of trinitrotoluene poisoning observed in this country, although Dr. Schultze[4] of New York, a few weeks before, had performed a necropsy on a man at the same munition plant in which he found lesions closely resembling those in this case.

The second case represents an unusual type of trinitrotoluene poisoning, having been observed only twice in the English cases, once with an associated toxic hepatitis with jaundice and once without these characteristic lesions.[3]

Fig. 1 (Case 1).—Section of liver showing extensive cloudy swelling, necrosis and autolysis of the greater part of the liver parenchyma; the periportal lymphocytic infiltration; hemorrhage in the parenchyma, and bile duct proliferation.

REPORT OF CASES

Case 1.[5]—*History.*—A white man, aged 24, who had always enjoyed good health, in April, 1916, started work in a munition plant devoted to the filling of shells with trinitrotoluene. He was employed in the mixing and stirring rooms, and his work consisted in dumping flaked trinitrotoluene into steam kettles, stirring it as it melted, and filling shells with the molten substance. There was no trinitrotoluene dust in the room. When he had been at this work for seven weeks, he complained to the factory physician of nausea and vomiting, slight abdominal pains and general weakness. The physical examination revealed a well nourished man with jaundice and tenderness in the epigastrium. He discontinued work, but grew gradually worse, and two weeks later was removed to a hospital, markedly jaundiced, vomiting persistently, prostrated and slightly delirious. There was no fever. He died in coma five days after admission.

The striking features of the case were the obstinate constipation, abdominal cramps, tenderness in the liver region, nausea and vomiting, prostration, progressively deepening jaundice, a low muttering delirium, anuria, and terminal coma. Similar symptoms are common in delayed chloroform poisoning, phosphorus poisoning, acute yellow atrophy, Weil's disease, and certain forms of fatal malaria.

In all these diseases the symptoms suggest hepatic failure due to extensive destruction of liver cells.

Necropsy.—This was performed three days after death. As the body had been embalmed, it would be of little value to give the entire protocol. The anatomic diagnosis was: toxic hepatitis with extensive destruction of the liver parenchyma; toxic degenerative tubercular nephritis; icterus; cloudy swelling of heart muscle; increased blood destruction in the spleen, and secondary anemia showing considerable polychromatophilia. A striking feature was the intense jaundice. The skin of the entire body was a deep chrome yellow, and all the viscera were bile tinged. The anatomic changes of chief interest were those in the liver.

When the abdomen was opened, the free edge of the liver appeared two fingers' breadths above the free costal margin. The organ was small and contracted. The serosa was smooth, glistening and free. On section the cut surface as a whole was grayish except for blotchy red areas where the embalming was imperfect. The region of the efferent veins was generally light red, soft, and somewhat collapsed. The periphery of the liver lobule was greenish gray, hard and firm.

Microscopically there was cloudy swelling of the liver cells with extreme fatty degeneration, followed by necrosis and autolysis of the liver cells leading to extensive destruction of the liver parenchyma. This destruction was so extensive that the liver cells in their normal cordlike arrangement were no longer seen, except occasionally in areas around and near a portal space. In the middle and inner parts of the liver lobule around the efferent veins the liver cells were no longer recognizable. Around the periphery of the lobule there was extensive lymphocytic infiltration, chiefly of small lympho-

3. Trinitrotoluene poisoning, Officially Communicated by the Ministry of Munitions, Lancet, London, 1916, **2**, 1026.
4. Personal communication to the author.
5. Presented before the New York Pathological Society, October, 1916.

cytes with occasional wandering cells, but few polymorphonuclears. The bile ducts at the periphery of the liver lobules showed extensive regeneration and proliferation. Throughout the liver tissue there were areas showing fine, greenish, granular pigment; in places this pigment was so abundant as to form cordlike masses, the so-called bile thrombi. There were numerous scattered areas showing hemorrhage, the tissue being filled with erythrocytes. Sections stained for fat showed marked fatty degeneration of the liver cells, the few left often being filled with small, fine, irregular fat globules. The necrosis seen in the liver was so extensive and diffuse that it was quite impossible to ascribe to it any zonal distribution, but there was some evidence that it was more severe in the region of the efferent veins, the best preserved liver cells usually being in the region of the peripheral space.

The picture was that of a toxic hepatitis characterized by extensive cloudy swelling, fatty degeneration and necrosis of the liver cells, most marked in the region of the efferent veins but not distinctly zonal in character; lymphocytic perilobular infiltration; bile duct hyperplasia; jaundice, and areas of extensive hemorrhage. The damage was beyond any known possibility of liver cell regeneration.

CASE 2.—*History.*—A white man, aged 50, who had always been in fair health, for several months had been employed in a munition plant devoted to the filling of high explosive 75 millimeter shells with trinitrotoluene. During the last two months he was working in that part of the plant in which cores were drilled out of the solidified trinitrotoluene to make room for the detonators. His work consisted mainly in sweeping the floors, which, in spite of a system of compressed air exhausts connected with the drills for the prevention of inhalation of an ingestion poisoning, became covered with trinitrotoluene dust.

When he had been at this work for a few weeks he complained to the factory doctor of nosebleed. He later complained of epigastric pain, weakness in the lower extremities and violent headache. On a few occasions he had coughed up and vomited blood. He stopped work on his own accord because of extreme weakness.

He was then attended by his family physician, who found him complaining of frontal headache, loss of appetite, weakness of lower limbs and bleeding from gums. The temperature was 102 F., and the pulse 90, weak and regular. The next day he was no better, having considerable bleeding from the gums, headache and epigastric pain. The following day his temperature was 99 F., the pulse weak and at times irregular; toward night he became delirious. The delirium, which was of a low muttering type, became worse, coma developed, and he died four days after the onset of delirium.

While he was sick, the hemoglobin was 30 per cent. and his red blood cells below a million; the exact type of blood picture, however, I was not able to obtain. The urine showed a trace of albumin, with hyaline and granular casts; the exact details were not obtained. This was all the laboratory work done on the patient while he was alive.

The striking features of the case were a profound anemia associated with hemorrhages from the mucous and serous membranes, terminating in delirium, coma with fever, and death.

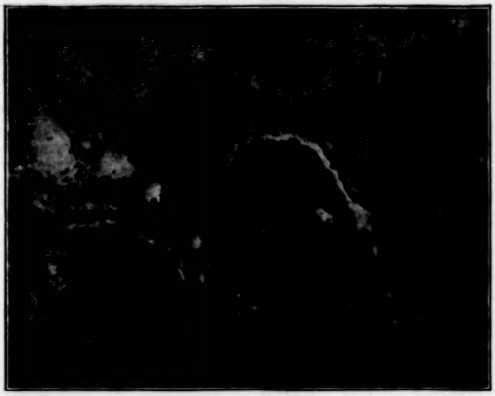


Fig. 2 (Case 1).—Section of kidney showing extreme cloudy swelling and fatty degeneration of the kidney tubules, and toxic degenerative tubular nephritis.

Necropsy.—The necropsy, performed shortly after death on the fresh, unembalmed body, revealed the chemical or physical origin of the fatal illness as acute aplastic anemia, with aplastic bone marrow.

The secondary or terminal lesions included: (1) hemorrhages from the mucous membranes, namely, the nose, gums, and small and large intestine; (2) hemorrhages from the serous membranes, namely, the parietal and visceral pericardium, endocardium, and piarachnoid; (3) low grade parenchymatous degeneration in the heart muscle, liver and kidneys, and (4) increased iron pigment in the spleen and the liver.

The diagnosis of acute aplastic anemia was based on: extreme pallor of the skin without icterus; preservation of body weight and nutrition; deep lemon yellow color of subcutaneous fat, well marked in the extrapleural fat; cloudy swelling in heart muscle, liver and kidneys of moderate degree; hemorrhage from the mucous membranes, as evidenced in blood clots around the gums and in the nostrils, with extensive bleeding in the small intestine, which, almost throughout its entire extent, was filled with a recent hemorrhage; hemorrhage in and from the serous membranes, as evidenced in multiple, extensive hemorrhages in the parietal and the visceral pericardium, in the endocardium and auricular walls, and scattered over the piarachnoid; increased iron pigment in the spleen and the liver, as shown in special stained sections of these organs; a replacement of the red bone marrow by fat tissue, there being no gross and little microscopic evidence of erythropoietic tissue in the bone marrow examined; and postmortem blood smears showing a profound anemia characterized by a great reduction in both red and white blood cells associated with little evidence of bone marrow regeneration, as shown by the absence of nucleated red cells, polychromatophilia, granular basophilia, etc.

The leukemias and leukanemias, both typical and atypical types, can be excluded. Pernicious anemia is excluded.

There was no evidence either in the gross or microscopic examination of the liver of a toxic hepatitis, other than the diffuse, low grade cloudy swelling of the liver parenchyma.

The etiology of the acute hemolytic aplastic anemia in this case is in my opinion "trinitrotoluene poisoning"; this is based mainly on the report of two similar cases in English literature,[3] both of which were described as very atypical types of trinitrotoluene poisoning. We have also the support of the clinical data, and the exposure to trinitrotoluene in a man 50 years of age, the latter fact supported by the observation of Drs. Livingstone-Learmouth and Cunningham that workers under 20 and over 50 years of age are particularly susceptible to the poisoning and should not be permitted to work in trinitrotoluene.

Time and Value.—Hippocrates truly said that art is long. The time occupied in doing an operation is no measure of the value of the service rendered. When Whistler in his action against Ruskin was sneeringly asked by counsel how long it had taken him to paint a picture which to the untrained eye doubtless seemed a hasty sketch in colors, his answer was "Twenty-five years."—*Brit. Med. Jour.*, Jan. 27, 1917.

PROSTATIC ABSCESS AND ITS SURGICAL TREATMENT

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Two cases of prostatic abscess, recently under my care, served as the stimulus to inquire more carefully into the etiology and therapy of this rather uncommon condition.

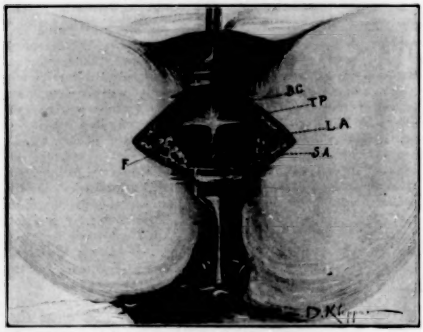

Fig. 1.—Normal anatomy and relations of perineum: *B. C.*, bulbocavernosus muscle; *T. P.*, transversus perinei muscles and fascia; *L. A.*, levator ani; *S. A.*, sphincter ani (superficial fibers); *F*, fat.

In spite of the frequency with which the prostate is affected in gonorrhea (Maelsch found prostatic involvement in 94 per cent. of all cases of posterior urethritis under his care), it is surprisingly seldom that actual prostatic abscess ensues. For example, Franz Marth reports from the files at the Bamberg Hospital but three cases, one following a recent gonorrheal infection, a second occurring in a patient with a tight stricture, and a third case in a normal individual in whom there was no apparent etiology. Söhngen reports but three cases from the extensive clinical material at Erlangen, none of which were associated with venereal infection. The reports of other authors are likewise meager as to the number of cases observed.

The etiology of prostatic abscess is interesting, as in certain cases the mode of entrance of the infecting organisms cannot be determined, and in others the primary focus of infection may lie remote from the genito-urinary tract. The most frequent factor, however, is venereal infection, usually with the gonococcus, which, during the course of a posterior urethritis, finds its way into the prostate and there may produce marked pathologic disturbances leading even to destruction of the major portion of the gland. In other cases abscess is due to invasion of other microorganisms, usually the staphylococcus alone, but at times in symbiosis with other bacteria. Prostatic abscess may be dependent on a remote pus infection, for example furunculosis, or carbuncle, which may have been long healed before the outbreak of prostatic symptoms. The mechanism here probably is: An infected thrombus becomes loosened and the infecting micro-organisms thus carried along in the blood stream find their way into the prostate. It is in accord with our theory of the localization of infection to assume that the prostate offered a site of "lowered local resistance." This fact is given emphasis by the statements that motorcycle riding, falls or other traumas are important factors in the causation of prostatic abscess. Caspar found among 386 cases of prostatic lesions but six cases of prostatic abscess, or 1.5 per cent., while among this number there were 186 cases of the usual types of prostatitis. While in the majority of cases there is a definite history of gonorrheal infection, others occur in which the etiology cannot be determined, and still another group in which the prostatic lesion is consequent on a focus of infection elsewhere in the body.

The distinct disadvantage of permitting abscess of the prostate to evacuate itself spontaneously, aside from complications, is the frequent recurrence of the abscess at intervals for an indefinite period.

The older methods of drainage from the rectum I believe may be passed over as an unsurgical procedure. The method which should occupy our attention is the perineal drainage as recommended by Dittel, Thompson and Zuckerkandl. Their technic, while unquestionably sound surgically in conception and almost invariably curative, has the disadvantage of cutting through the central tendon of the perineum, which often leads to the patient's inability to have erection and ejaculation. The technic of the method mentioned calls for the cutting apart of the rectourethralis muscle, and the division of the central tendon, the aponeurosis of the fibers of the sphincter ani and the transversus perinei superficialis. A modification of this method seems to me to offer advantages in that the central tendon is preserved, and that neither the origin nor the insertion of the various muscles is interfered with. The procedure is:

1. Skin incision concave between the two tubera ischii, the concavity directed toward the rectum at the middle of the depressio retrobulbaris, usually about 3 cm. in front of the anus.

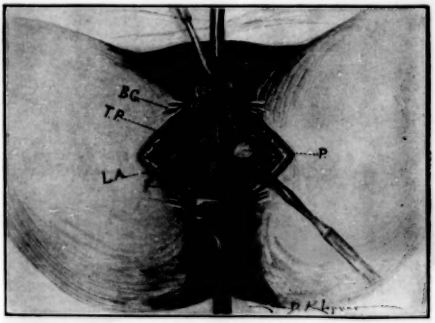

Fig. 2.—Operative procedure, the retraction of the fascia and transverse perineal muscle, the splitting of fibers of the levator ani exposing the prostatic fascia: *B. C.*, bulbocavernosus muscle; *T. P.*, transversus perinei muscles and fascia; *L. A.*, levator ani; *F.*, fat; *P.*, prostatic fascia and capsule.

2. Division of the often rather thick subcutaneous tissue and fat, exposing the superficial muscles and the central tendon of the perineum.

3. Entrance to the prostatic capsule, gained by dissection to one side or the other of the median line, as indicated by findings of rectal palpation. The fascia

and transversus perinei muscles, superficial and deep, are elevated and held by small retractors; and then by the splitting of the fibers of the levator ani in their long axis, the rectovesical layer of the pelvic fascia comes into view. This and the prostatic capsule then may be readily incised and drainage established. It is well to explore thoroughly with the finger and break down, if necessary, any fibrous septa so that the entire part involved may be thrown into a single cavity and thoroughly drained. For drainage a large caliber, soft rubber tube is best for the first twenty-four to thirty-six hours. After its removal, packing with sterile or iodoform gauze strips are most satisfactory. The drainage will last usually from three to four days, when the packing may be gradually withdrawn.

Guiteras and others recommend drainage by incising the prostate through the urethra with a guarded bistoury after perineal section. This technic seems to have the disadvantage in the first instance of not being under the vision of the operator, and secondly of producing a urethral fistula which, even under the most favorable circumstances, heals very slowly, and frequently leads to stricture.

25 East Washington Street.

ECHINOCOCCIC BONE DISEASE

REPORT OF A CASE *

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AND
W. T. CUMMINS, M.D.
SAN FRANCISCO

The invasion of the osseous system by the taenia echinococcus is a rare event. Many surgical textbooks make either no reference or a cursory one to this disorder. After a careful survey of literature, reports of eighty-eight cases have been found.

The relationship of the liver to the alimentary tract makes obvious the relative frequency of involvement of that viscus; but for involvement of bones it would seem that the parasite must gain access to the vena cava, heart and general arterial circulation, although lymphatic distribution has been mentioned by some observers. Trauma appears to play an important predisposing rôle. Long bones most frequently are affected, and their epiphyseal portions are usually the primary focus of disease. A coexisting visceral and osseous involvement is exceedingly rare, and a satisfactory explanation of this fact has not been forthcoming.

The symptoms include a slowly progressive, painless increase in size of the bone, with spontaneous fracture in a number of cases. Only in the later stages is pain complained of. Several cases were not diagnosed until fracture had taken place. Roentgen examination shows rarefaction. Operative procedures reveal usually an inflammatory periosteal thickening with atrophy of the bone and enlargement of the medullary cavity. The echinococcic or hydatid condition is a polycystic one, and the medullary cavity is found to be closely packed with cysts of varying size. In the bone itself the process is a regressive one, and, with the atrophic changes, sequestrums of various sizes may be found.

A suppurative osteomyelitis has complicated the condition in a few instances. The cysts have smooth, yellowish interiors with occasional flat, warty projections. The fluid rarely contains scolices or hooklets, but there are certain characteristics, as described by Malenjuk, which are considered as important points in the diagnosis of the disease: (1) low specific gravity; (2) absence of albumin; (3) absence of mucin and paralbumin; (4) presence of succinic acid, and (5) absence of epithelial cells. Spontaneous fracture of a long bone after trivial injury, without tendency to unite, is a symptom that should be considered suggestive of the disease. The fluid seems to contain a toxic substance, for its resorption may cause urticaria, joint-pains, fever and syncope as the symptoms of a general intoxication. Moursson and Schlagdenhauffen have demonstrated in the fluid of a goat experimentally infected a "ptomain" which had the characteristics of protein split products. Boinet isolated a toxin which in small doses was fatal for mice, guinea-pigs and rabbits.

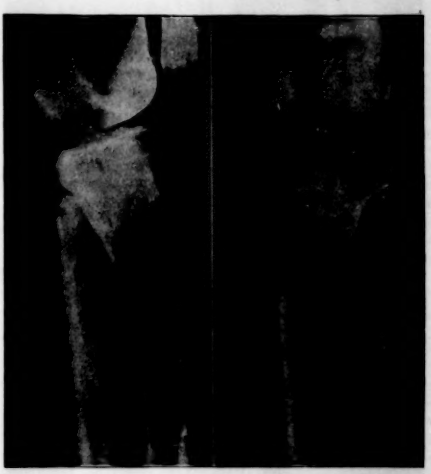

Fig. 1.—Echinococcic bone disease: condition on entrance of patient.

In the table of references the age and sex in fifty-three cases are noted. Of these, two were in the first decade, six in the second, sixteen in the third, thirteen in the fourth, seven in the fifth, seven in the sixth and two in the seventh. The youngest was 1 year old, and the oldest, 80 years. There were thirty-two males and twenty-one females. The frequency of involvement of the various bones was: pelvis (one or more bones), thirty-two cases, or 36 per cent.; femur, sixteen cases; sacrum, thirteen cases; humerus, ten cases, and tibia, nine cases. The clavicle, radius, ulna and fibula would appear to be the only large bones unaffected.

Of 1,950 echinococcus cases in literature, Alexinsky found only thirty-seven (1.9 per cent.) with bone involvement, and Gangolphe, fifty-two of 3,000 cases (1.7 per cent.).

REPORT OF CASE

History.—T. P., man, aged 31, Greek, pipe-helper, was admitted, July 31, 1915. The family and previous personal history were negligible. The present condition would seem to have begun three years before, when the patient noticed

* Because of lack of space, this article is abbreviated in THE JOURNAL by the omission of a table of references. The complete article appears in the authors' reprints. A copy of the latter will be sent by the authors on receipt of a stamped addressed envelope.

severe aching pains in the upper third of the left tibia. These were paroxysmal in character and worse at night. At times the leg became much swollen in the region of the pain. There was no history of trauma. There seemed to have been no suspicious contact with dogs.

Fig. 2.—Condition after first operation.

Examination.—The patient was very poorly nourished. Except for weakness and irregularity of heart action there appeared nothing abnormal in head, trunk and arms. The left leg showed slight increase in size of the upper third and some tenderness on deep palpation. Scars over the lower third of the thigh and leg would indicate old injuries. A roentgenogram revealed a cystic condition of the tibia through its upper third. Urinalysis revealed: specific gravity, 1.034; acid; albumin and glucose negative. Blood pressure was 120 mm. systolic, and 85 mm. diastolic. Tuberculin reactions and two serum Wassermanns were negative. The blood, on admission, was: leukocytes, 6,400; May 4, 1916, erythrocytes, 4,440,000; leukocytes, 12,220; neutrophils, 70 per cent.; small lymphocytes, 20 per cent.; large lymphocytes, 10 per cent.

Treatment and Course.—The localized pains and edema continued, and on the fourteenth day after admission the tibia was opened and curetted. Atrophy of the bone and enlargement of the medullary cavity were noted. Many cysts of various sizes were found throughout about two thirds of the length of the bone. The interior surfaces of these generally were smooth, but occasional warty projections were evident. No scolices or hooklets were found in the fluid, which was slightly yellow. Albumin and epithelial cells were absent. Succinic acid could not be demonstrated. A well defined lamination of the cyst walls was observed. The bone cavity was cauterized with alcohol, packed, and drainage established. Beginning two days after the operation, the temperature rose and maintained an average of 99 F. for one week. After a time the patient complained again of pain, and, November 16, the sinus was opened, curetted and packed. No cysts were found. This gave some relief, but moderate pain persisted. About four months afterward he complained of increased pain and on a swabbing out of the wound a collapsed cyst appeared. A curet withdrew another intact one. April 6, 1916, a more radical operation was done with enlargement upward of the skin incision to the articular surface of the bone, and a large amount of cancellous tissue was chiseled out. There were found a number of small cysts separated apparently by normal bone. The cavity was swabbed out with pure phenol (carbolic acid) followed by alcohol and then packed. The wound healed slowly by granulations, without infection. Gauze dressings alternately with camphor, phenol and 10 per cent. black oil (balsam of Peru in castor oil) were employed. After the third operation the leg was exposed daily to the sun's rays for a period of about two hours (when the weather permitted). The wound completely healed, and the patient was discharged, Aug. 10, 1916, walking with the aid of a cane. The total time spent in the hospital was 377 days.

Fig. 3.—Condition on discharge of patient.

November 22, the leg was healed, but the patient had been unable to work. He felt well.

One month later he felt quite able to work but had not returned.

Southern Pacific General Hospital.

BOLUS OF NINETY-FIVE HAIRPINS REMOVED FROM THE STOMACH

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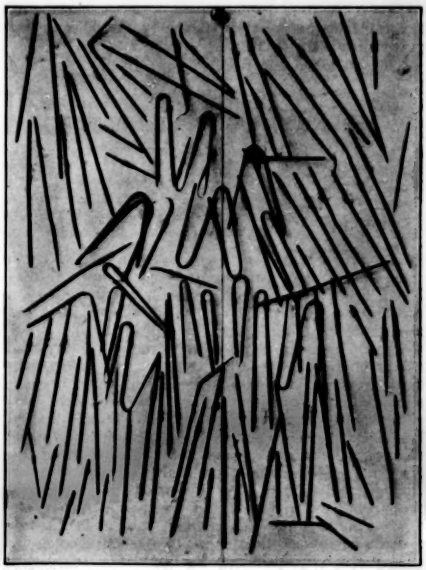
The case here reported is unusual in many respects, and although the articles swallowed were simply hairpins, their intimate impaction with the chronicity of development characterize the tumor as a bezoar.



Hairpins and remnants of hairpins removed from the stomach.

Miss O. A., white, aged 35, born in Spain, gave a negative family history as regards dementia, though all of the immediate relatives are distant, retiring, and elusive to strangers. The previous history was unimportant. The onset of the present complaint dated back about three or four years, since which time the patient had gradually, though progressively, failed in health and strength. She suffered constantly from vague, though sometimes acute, lancinating, abdominal pain, digestive disturbance or other intestinal disorder. The mother had frequently consulted physicians regarding her daughter's condition, but, because of her annoying secretiveness, persistent irritability and expressed aversion to doctors, a satisfactory examination was impossible, and diagnosis a guess. During the past two months a septic temperature had always been present; the extreme toxemia with its depleting,

concomitant syndrome confined the patient entirely to bed. Solid food was vomited immediately. Bland unirritating liquids could be retained if given in small quantities. The daily temperature oscillated from 99 to 102, the pulse from 120 to 125, and respirations from 20 to 25. The patient's mental condition was far below par. The patient was extremely emaciated, weighing probably 75 pounds. She was profoundly anemic, and the lower limbs were edematous. The heart, lungs, liver and kidneys were normal. The musculature of the entire body was flabby and devoid of tone. The abdomen was slightly distended with fluid, and a hard tumor was palpable just below the umbilicus. As the patient lay in bed, the thighs were constantly flexed on the abdomen. Urinalysis was negative.

Blood examination revealed a slight leukocytosis with decrease of red cells proportional to the degree of emaciation and anemia. The gravity of the case did not justify further delay for diagnostic purposes, so an exploratory operation was deemed expedient with the provisional diagnosis of tuberculous peritonitis. A bezoar was unsuspected. Because of the lowered mentality and extreme obstinacy of the patient, careful palpation of the abdomen was impossible, and even the local preparatory measures for operation, shaving and cleansing, had to be carried out in the operating room while the subject was anesthetized. The abdomen was slightly distended with fluid and very painful. For these reasons the tumor was not recognized prior to operation.

A median incision was made below the umbilicus. On general survey the most noticeable and only apparent abnormality was the extreme ptosis of the stomach below the umbilicus, evidence of a low grade of peritonitis, and the presence of a small amount of clear fluid in the general cavity. Manual exploration disclosed a normal pelvis, appendix and gallbladder. The stomach was filled with a hard, tumor-like mass having many sharp points which pierced and were embedded in the indurated gastric wall. Gastrotomy revealed these to be numerous hairpins, which had been sharpened and pointed by the churning movement of the stomach together with the corrosive action of the free acids. Ninety-five pins or remnants were removed, some pointing high into the esophagus, others low into the duodenum.

The patient did not improve after the operation, but died of exhaustion on the seventh day.

The important lessons to be learned from this case are:

1. Corroborative testimony that bezoars, other than trichobezoars, occur most frequently among the insane.

2. The demand for roentgenoscopy in all obscure abdominal conditions.

3. The unusual feature that nothing other than hairpins were found in the stomach.

4. The remarkable digestive powers of the gastric juice, every hairpin being somewhat eroded and many almost entirely destroyed.

5. Nature's prolonged fight against such odds, extending probably over a period of three or four years, as only one of the entire group retained the identity of a hairpin, showing that the mass had been in the stomach for a considerable time and that none had been swallowed since the patient was under such close observation. The thickened indurated gastric mucosa, in places as much as from ½ to 1 inch, gave additional testimony to the chronicity of development.

Bezoars should always be considered as one of the possibilities in the differential diagnosis of obscure abdominal tumors. We should keep ever on our guard, use the Roentgen ray frequently, and remove the abnormality as early as possible.

1407 Carrollton Avenue.

The Hospital and Medical Training.—Much emphasis is placed nowadays on the clinical training of the medical student, and it is obvious that such training cannot be given by a medical school which does not command the facilities of a suitable hospital. Hospitals that disinterestedly lend themselves to the purposes of medical education are pursuing a wise social policy, and are serving many patients besides those in their wards.—S. S. Goldwater, M.D., *Modern Hospital*, November, 1916.

THE VISUAL REQUIREMENTS OF MILITARY AVIATORS

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CHICAGO

The advent of the aeroplane in modern military equipment has made it necessary to modify to some extent the method of physical examination of applicants. Because of the unusual and, until within a few years, the absolutely unknown conditions which the aviator must encounter, there must be a special standard of physical fitness, quite different in some respects from that required of men in other branches of military service. In times of peace the physical standard in all branches of the service should be maintained at the highest possible point. In time of war, when the need for all available fighting forces is urgent, the physical requirement of recruits might have to be considerably lowered. To lower the standard required of aviators, however, even in time of war, would be to incur the danger of most serious risks.

Military writers on the different European battle fronts tell us that if an infantry attack is to succeed there must first be a perfect artillery preparation. There can be no such preparation unless all the targets are accurately located and the exact firing data necessary to hit them previously determined. This is done by taking large numbers of photographs of the enemy's position. The various batteries are then assigned their targets and commence their ranging fire. Trained observers in aeroplanes fly above the targets and signal back to the batteries whether they are over or short, etc.; other aeroplanes observe the progress of the attack, and from time to time report to the general in command. Such work as this necessitates a thorough and long continued reconnaissance, which can be made only by highly trained observers in aeroplanes many times a day for many days. To succeed in this work enemy aeroplanes must be destroyed or driven away by the use of a superior number of fighting aircraft. As one of our modern army men has said, "The preparation and carrying out of a modern attack are absolutely dependent on a proper aviation service. We have in the United States no fast armed machines capable of bringing down such battle machines as every European nation now possesses. We have no officers properly trained in photographic reconnaissance, in the observation of artillery fire, and in the keeping of proper communication between assaulting artillery and infantry, and between it and the general command." These facts are referred to only to emphasize the importance of having for this work men in our service endowed in the highest degree with physical fitness.

In a recent article in one of our military publications on the examination of aviators, the writer devotes over two pages to the examination of the labyrinths. It is of the utmost importance for the aviator to possess normal functions presiding over the maintenance of bodily equilibrium under a definite set of conditions. I believe, however, that it is of equal importance to know the ocular conditions present: not only the visual acuity but also the entire ocular apparatus, a phase of the examination to which the writer devoted only a single paragraph. Assuming that the applicant has successfully passed the other requirements of his physical examination, what should be his visual requirements?

Huss (Marine-Oberstabarzt), in his recommendations for the eye examinations of flyers,[1] includes the history, objective examination, refraction, acuteness of vision, visual fields taken roughly by the hand, and the pupillary reaction.

Unless the subheading "objective examination" is more comprehensive than would generally be included under this term, it seems to me that there are a number of important omissions in this list for the routine examination.

Visual acuity of $^{20}/_{20}$ in each eye is, of course, of prime necessity. This is a much higher standard than is required of recruits in most of the continental armies. In the British army, the standard for general service requires, without correction, vision of $^{6}/_{24}$ in the better eye and $^{6}/_{60}$ in the worse eye, which must be the left. In Germany, combatants are required to have corrected vision of at least $^{6}/_{12}$ in one eye, while in the other the corrected vision may be minimal, and in the Landsturm the second eye may even be blind. In the armies of Germany, Austria, France and Italy, more than 6 diopters of myopia are allowed. Because of the constant demand on the eyes for absolutely clear vision, from the time the aviator begins his ascent until he has made a safe landing, a visual acuity of less than $^{20}/_{20}$ vision in each eye might be a serious handicap. Even with normal vision in each eye, the aviator must have normal binocular vision, as otherwise his estimation of distances and of the relative locations of places and objects would be valueless, and his own safety as well as that of his machine would be in serious jeopardy when he attempted to make a landing. There should be normal muscle balance as well as good abductive and adductive power. While in the air the aviator's eyes are in constant motion and would quickly tire under the excessive strain on weak ocular muscles.

The presence of nystagmus should disqualify an applicant. Of the considerable numbers of miners who have applied for army service in England, Huss[2] says it is the opinion of the examining surgeons that it is a serious mistake for men who have the slightest tendency to nystagmus to be subjected to the arduous strain of military service. Attacks of giddiness may come on at any time. It can be readily understood how much more liable to such attacks the aviator would be. To attempt to measure rightly the field of vision by the confrontation method might mean the overlooking of a sector of considerable size in some part of the periphery, to say nothing of the presence of scotomas. Moreover, in any suspicious case a perimetric chart of the fields would be of great value in a subsequent examination. A cycloplegic should be used in all cases, not only for determining the absolute refraction, but also in order to see the peripheral parts of the fundus and to detect any evidences of a previously existing iritis or uveitis. The visual requirements of the aviator are somewhat similar to those of the chauffeur, and it is interesting in this connection to note that an English observer has shown concrete instances of men with serious defects of vision driving vehicles on the crowded public thoroughfares. Men with 12 diopters of myopia, with disseminated choroiditis, with nystagmus, and even with occlusio and seclusio pupillae from chronic iridocyclitis have been detected. This at once suggests the need of a law requiring a rigid eye examination for chauffeurs.

1. Translated in U. S. Naval Med. Bull., Jan. 14, 1917.
2. Huss: Brit. Med. Jour., March 4, 1916.

One of the most important features of the eye examination seems to have been altogether ignored, namely, the examination of the color sense. We have learned that in former years, before color blindness was known to be such a common affection, ocean disasters and railway collisions resulted in a number of instances solely because of the inability of the pilot or engineer to distinguish between the red and green signal lights. In these days no color blind man can ever hope for a position as railroad engineer or as a naval officer. The military aviator's duties require in no less degree normal color sense. At a height of a few hundred feet from the ground it would be impossible for a red-green color blind observer to distinguish red uniforms of soldiers from the surrounding green foliage, even in the most favorable atmospheric conditions. His difficulties would be multiplied in cloudy or hazy weather. It is known that among all classes of males, regardless of birth or education, about 4 per cent. have defective color sense. Of over 300 men who recently applied for examination for aviators in the officers' signal section of the Medical Reserve Corps, only eighty-six were found eligible for the examination, and of these eighty-six, only thirty-nine passed a successful physical examination. Of these thirty-nine selected men, one was rejected on account of color blindness. This would indicate a ratio of over 2 per cent. of color blindness in otherwise physically perfect men. The desire for adventure with its attendant element of danger is undoubtedly a strong inducement for young men to enter this branch of the service. Their bitter disappointment in failing to qualify is sufficient proof that tests for malingering are not necessary. The one man referred to declared that he could distinguish all colors perfectly, and it was only after proving to him by three different tests, all of which showed the same results, that he finally admitted that he did have some difficulty in seeing red lights when driving an automobile.

In our limited experience, but little has been reported on the effects of dazzling. In European countries, however, this factor has been of sufficient frequency to receive some attention. Some form of tinted lenses mounted in padded goggle frames should be worn as a protection against dazzling, as well as to shield the eyes from wind and dust. One flyer told me that, at a height of several hundred feet above a sand bank, fine particles of sand struck his face with the intensity of needle pricks.

Emergencies may arise at any minute calling for instant action. A faulty action of the engine, for instance, or the sudden appearance of antiaircraft guns necessitates a quick change of course. In order to estimate the length of time it requires to respond after receiving a visual impression, applicants for aviation service in France are required to undergo a psychophysical examination. By means of the d'Arsonval chronometer it has been determined that a good candidate for aviation requires about $^{19}/_{100}$ second for visual reactions.

There should be a reexamination of the eyes at least once a year. Until the beginner has had a few weeks of actual experience, he cannot know the effect on his eyes. The sensitiveness of the retina, endurance of the eye muscles, etc., can be determined only after practical trial.

SUMMARY

The successful applicant for army aviation service should have:

1. Uncorrected vision of 20/20 in each eye.
2. Binocular vision.
3. Absence of nystagmus.
4. Normal muscle balance and competent ocular muscles.
5. Normal pupillary reaction and no pupil irregularities when dilated.
6. Normal media and fundi.
7. Normal visual fields, by perimetric examination.
8. Normal color sense.

7 West Madison Street.

HORSE ASTHMA

TREATMENT OF A CASE WITH NORMAL HORSE SERUM

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Mrs. L. B., aged 28, widow, came under my care in July, 1916. The family history was negative. She had been subject to severe attacks of horse asthma since childhood, whenever she was near horses for a few minutes. She could neither ride nor drive for this reason. Two years ago she had the anterior portion of both lower turbinates removed, on account of nasal obstruction, with no effect on the asthma, and only slight relief of nasal obstruction. The personal history otherwise was negative. The patient was not neurotic.

July 4, I rode horseback with the patient and witnessed an attack. Thirty minutes after beginning the ride she began to sneeze, and at the end of an hour she was almost prostrated, with constant sneezing, severe lacrimation, intensely congested sclera, considerable edema of glottis, and complete nasal occlusion.

August 1, I gave the patient 25 c.c. of normal horse serum intravenously. By the time half the dose was introduced, she began to sneeze, and within a few minutes she was undergoing a severe attack of horse asthma, similar to the one I witnessed in July, only with symptoms more pronounced, if possible, especially the glottic edema. Under applications of epinephrin solution, 1:1,000, the edema subsided.

About two weeks later on exposure to horses she developed an attack of asthma, milder than usual. At the end of three weeks I gave 12 c.c. intravenously without any reaction. This was followed at intervals of about two weeks with doses of 25, 40 and 60 c.c. hypodermically, without any reaction.

Now, six months later, she reports that she has not had an attack since the second dose of serum, that she rides and drives at pleasure, has gained in weight and is delighted with the result.

THE PNEUMOCOCCUS FOUND IN A CASE OF STILLBIRTH

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Recently Dr. Joseph B. De Lee[1] reported three cases of infection as a cause of stillbirth. To this list I wish to add the following case (Case 90153, Michael Reese Hospital): The patient, aged 26, married four years, came under my care, May 4, 1916. She had had a stillbirth with the first child at full term. At this delivery it was stated that the child had a nasal discharge. No cultures were made. The infant weighed 7½ pounds. Two years later she had a miscarriage which required a curettement. The perineum was repaired at that time. The date of her last period was Oct. 9, 1915. Life was felt about the fourth month. In May the patient complained of feeling weak and of severe cramps in the abdomen. Under appropriate bowel medication she improved. She has had frequent nosebleeds for years. The appendix had been removed three years before; the tonsils had been removed six years before (apparently clipped or incompletely removed). The patient's habits were regular, and she did not use alcoholics.

Examination revealed a nervous woman, whose general appearance was good. The blood pressure was 130-70. The measurements were external, 23-26-28-19 cm.; internal diagonal, 12 cm. Urinalysis was negative. June 21, 1916, the blood pressure was 120-70. The patient felt well, and the urine was negative.

July 19, 1916, the patient was still in good condition. The child, though not a large one, was kicking well. The head was still floating. The heart tones were good, the rate being 132.

Aug. 3, 1916, at 8 p. m., the patient was admitted to the hospital, having been in light labor since 2 p. m. On rectal examination the cervix was dilated two fingers and thin. The head was not engaged. The fetal heart rate was 140. At 10:30 p. m. there was a dilatation of three and a half fingers. The fetal heart rate was 136. The head was fixed in the pelvis in right occipito-anterior presentation. At 1:30 a. m. the same findings were present. The pains were then becoming stronger. The heart rate was: 12 p. m., 140; 1 a. m., 132; 2 a. m., 132; 3 a. m., 132; 4 a. m., 124; 4:20 a. m., 124; 4:42 a. m., 116; 4:50 a. m., 112.

The bag of waters was ruptured artificially at 4:50. Before artificial delivery could be accomplished, the infant died. The liquor amnii was filled with meconium. At 6:20 a. m., 3 minims of pituitary extract were given to stimulate the pains, and a female was born at 7 a. m. It was in a state of asphyxia pallida. The weight was 6 pounds, 5 ounces. Necropsy on the infant revealed nothing pathologic, except that all the serous cavities contained more fluid than is usual.

Cultures were made from the dura, pericardium, nose, heart's blood and pleural and abdominal cavities. The pericardium gave a pneumococcus and a gram-positive bacillus. The pleural cavity gave a pneumococcus and a staphylococcus. The Wassermann reaction was negative.

A Wassermann test on the mother was also negative. A culture from the tonsil crypts and from the vaginal discharge showed the pneumococcus and the staphylococcus in each. In spite of this, the episiotomy wound healed by first intention.

It is my purpose to attempt to deliver a live baby later by having the mother's nose and throat put in good condition and to keep on the lookout for a focal infection by having the blood and vaginal secretions examined for pneumococci and staphylococci.

The bacteriology was done in the hospital laboratory.

122 South Michigan Avenue.

1. De Lee, J. B.: A Bacteriologic Study of the Causes of Some Stillbirths, THE JOURNAL A. M. A., July 29, 1916, p. 344.

A CASE OF MULTIPLE PREGNANCY, RUPTURED TUBAL AND UTERINE

E. A. SULLIVAN, M.D., AMBOY, ILL.

Mrs. J. S., aged 42, tertigravida, May 6, 1916, at 4 p. m., while doing housework, was seized with an agonizing pain, referred to the diaphragm. When I saw the patient she was pale and had a pinched facial expression. The pulse was dicrotic; the rate was 160. The temperature was subnormal. At this time I administered ½ grain of morphin hypodermically to relieve the pain. On examination I found the uterus somewhat enlarged, the cervix elongated, the external os patulous. There was a serous bloody discharge. At this examination nothing abnormal was found in the culdesac or abdomen; but two hours later a tumefaction in the culdesac suggested ruptured tubal pregnancy. The patient was moved to the Amboy Hospital, and Dr. Karl F. Snyder of Freeport was called to operate.

The pelvis and culdesac were filled with clotted blood and a fetus; these were removed and the bleeding tube ligated and sewed; drainage was put in and the abdominal wound sewed up. During the operation pressure on the uterine walls

outlined a fetus in the uterus, leading to a diagnosis of multiple pregnancy. The patient was removed from the operating room and put in the Fowler position. Physiologic sodium chlorid solution was given with epinephrin solution hypodermically to combat shock. The patient made an uninterrupted recovery and, December 24, was delivered of an 11 pound boy.

AURICULAR FLUTTER DETECTED BY THE FLUOROSCOPE*

George W. Holmes, M.D., and Paul D. White, M.D., Boston

The fluoroscope has often been used in the examination of arrhythmic hearts. The discovery, however, of an unsuspected auricular flutter during a routine chest examination of a patient with suspected gastro-intestinal lesion is of such interest that it deserves special mention.

History.—G. B., man, aged 62, employed for over forty years as painter and paperhanger, referred to the Massachusetts General Hospital for diagnosis, complaining of indigestion, had always been well until four months before visiting the hospital. At that time attacks of pain in the region of the umbilicus began. They were most frequent early in the morning, waking the patient at about 2 o'clock and compelling him to rise and pace the floor. Gradually the pain had become more persistent, until it was present much of the time. Hot applications gave some relief. There had been no nausea or vomiting. No relationship could be discovered between the kind or time of meals and the pain.

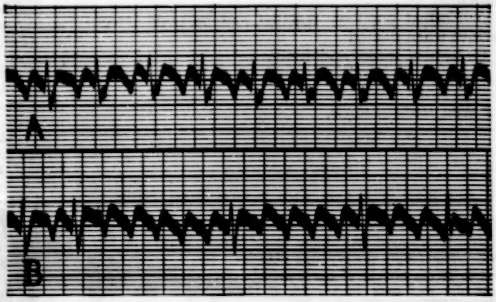

Fig. 2.—Lead II of electrocardiogram showing auricular flutter: *A*, before vagal pressure, *B*, during right vagal pressure; abscissa, 0.2 second; ordinate, 10^{-4} volt.

Yet the patient had been afraid to eat much and had lost 30 pounds in weight in the four months. He was slightly constipated. There had been no weakness of the hands or feet, and no dyspnea, edema or precordial pain.

Examination.—The patient, June 30 and July 7, 1916, was pale and underweight. All the teeth were false. The tongue was coated. The pupils reacted normally. The lungs were normal. There was slight enlargement of the heart to percussion; the apex impulse was in the fifth space. The action was regular and rapid (115 a minute). The sounds were faint and clear. There was absence of abdominal tenderness, spasm and masses. The liver and the spleen were not felt. There was a marked venous prominence at the costal borders. There was a double inguinal hernia. Rectal examination was negative. The reflexes were normal. The temperature was normal. A blood smear was normal; there was no stippling. Hemoglobin was 90 per cent. The urine was cloudy; specific gravity, 1.022; there was no albumin or sugar; the sediment showed nothing remarkable. Fluoroscopic examination by means of a bismuth meal showed no abnormality in the gastro-intestinal tract.

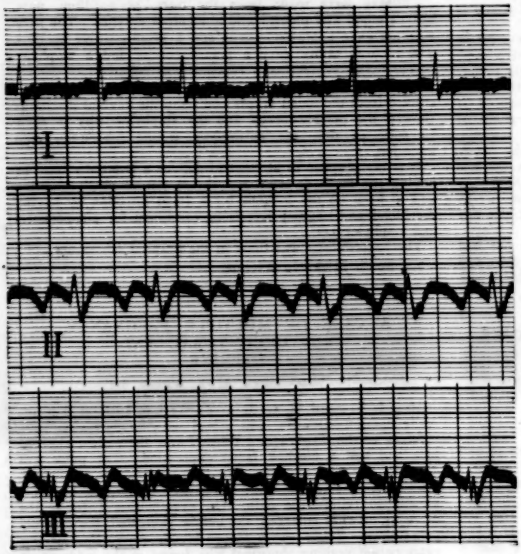

Fig. 1.—Leads I, II and III of electrocardiogram showing auricular flutter; abscissa, 0.2 second; ordinate, 10^{-4} volt.

Fluoroscopic Examination of Heart.—The right and left borders were clearly outlined, the left border pulsating regularly at the rate of 115 a minute and the right border regularly at apparently twice the rate. A diagnosis of auricular flutter was made and confirmed a few minutes later by the electrocardiograph.

Electrocardiograms.—There was auricular flutter with 2:1 A-V block. The auricular rate was 230, ventricular rate, 115 (Fig. 1). Right vagal pressure increased instantly the grade of block, bringing out clearly the separate auricular deflections (Fig. 2.).

* From the Massachusetts General Hospital.

Unusual Foreign Bodies in the Rectum.—It is not unusual to find foreign bodies in the rectum which have been inserted by the patients themselves, who are usually sexual perverts. I recently had three cases in which the object inserted was an ordinary jelly glass. Another case proves that glass electrodes inserted into the rectum for the treatment of hemorrhoids and prostatic troubles are not without some danger. In this case, a physician was using an ordinary high-frequency glass electrode for the treatment of the prostate. The tube suddenly exploded while inserted 3 or 4 inches into the patient's rectum. It was broken into many pieces, and I removed it with considerable difficulty. The bowel, however, was not lacerated, and the patient suffered no injury.—William H. Kiger, M.D., Los Angeles.

Special Article

TYPHOID IN THE LARGE CITIES OF THE UNITED STATES IN 1916

FIFTH ANNUAL REPORT

THE JOURNAL presents herewith its fifth annual survey[1] of typhoid fever mortality in those cities of the United States having over 100,000 population. The cities included in the summary number sixty, and are the same as those reported last year.[2]

Group 1, which contains the nine largest cities in the country, comprises a population of 13,743,746, or about 14 per cent. of the total population of the country. All but three of these cities established a new low record for typhoid fever in 1916. The three cities with somewhat higher rates in 1916 than in 1915, Philadelphia, St. Louis and Detroit, showed improvement, nevertheless, over the average from 1911 to 1915.

Boston achieves the best position and, indeed, reaches a remarkably good figure (3.5), the lowest point yet touched by any member of Group 1. Boston, however, is closely pressed by New York for first place. The health officials in these two cities are to be congratulated on the success of the unremitting campaign they have waged in the past ten years against typhoid fever. The painstaking efforts in New York to discover carriers and place them under control have evidently borne good fruit. The New York Department of Health comments in one of its recent weekly bulletins on the absence of public interest in the success which has attended the efforts of the department in the reduction of typhoid fever. Little notice has been taken of the fact that within ten years the typhoid rate has been reduced to less than one-third its former dimension. This difference in rates represents a saving of over 600 lives, and is certainly an achievement on which any administrative health authority might pride itself. The record deserves the widest possible publicity. Boston and New York have set a high standard for the rest of the country.

TABLE 1.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 1 (OVER 500,000 POPULATION)

	Deaths from Typhoid per 100,000 Population		Average	Average
	1916	1915	1911-1915	1906-1910
Boston	3.5	5.5	8.0	16.0
New York	3.8	6.0	8.0	13.5
Chicago	5.2	5.4	8.2	15.8
Cleveland	5.3	7.8	10.0	15.7
Philadelphia	7.8	6.6	11.2	41.7
Pittsburgh	8.6	10.3*	15.9*	65.0
St. Louis	9.4	7.0	12.1	14.7
Detroit	15.0	12.8	18.1	21.2
Baltimore	18.0	21.9	23.7	35.1

* An error in the figures reported to us last year has been corrected in this tabulation.

Chicago reports a rate (5.2) substantially the same as that of 1915 (5.4). This is slightly higher than if a localized water-borne outbreak had not occurred in January, 1916. According to the estimate of the health department, 105 cases and eight deaths should be attributed to the accidental contamination of the water at that period. The outbreak was due to the entrance of sewage into the pumping well of the Sixty-Eighth Street pumping station following the flooding of the sewers by a heavy rain and thaw, January 20 and 21. Without entering into the merits of the controversy between the Chicago Health Department and the Sanitary District of Chicago regarding responsibility for this unfortunate occurrence, it may be observed that a pumping station so constructed as to make it possible for sewage to back up and flow into the suction well is not above criticism. The total rate in Chicago, however, is little affected by the inclusion of the deaths attributed to this source. As has been the case in the past few years, the 1916 rate is exceedingly low.

With respect to the typhoid situation in Chicago, students of vital statistics will be interested in referring to the *Bulletin* of the Chicago Department of Health for Oct. 21, 1916, in which a special plea is made for "utmost care in the filling out of certificates and in assigning both the immediate and remote causes of death," typhoid deaths being especially emphasized in the accompanying statement. The probable motive and effect of such an appeal are matters for conjecture. It is interesting to note that in 1915, forty-three typhoid deaths were recorded in Chicago in the last quarter of the year, while in 1916 only eighteen deaths were officially assigned to this cause.

Cleveland, in spite of a rather marked increase of typhoid in August, records a very low annual rate. Full operation of the filtration plant, construction of which has been somewhat delayed, should improve the water conditions in Cleveland. Meanwhile a careful watch is being kept over the supply and chlorination sedulously practiced.

Pittsburgh seems to have joined permanently the list of cities with a very low rate. To those who have been familiar with the high typhoid rates which prevailed in this city for many years, it is as surprising as it is gratifying to note that the rate in 1916 was hardly more than one-eighth the average for 1906-1910. Philadelphia is running a neck and neck race with Pittsburgh for low place, just as for several decades it vied with the latter city for the unenviable distinction of the highest typhoid rate among the large cities.

Baltimore makes a new low record, and is evidently profiting from the installation of a filtered water supply in September, 1915, and from the efforts which are being made to correct the milk situation.

Detroit alone among the cities of this group shows relatively little improvement. It may even find itself at the bottom of the list as time goes on. There is evidence, however, that the responsible authorities of Detroit are awake to the situation, and that this city will not long be allowed to suffer from a typhoid rate three to four times as high as that in Boston, New York and Chicago. The way in which Baltimore has closed up the gap between itself and Detroit should prove an incentive.

The tabulation of the cities of Group 2 (from 300,000 to 500,000 population) shows more with increased than decreased typhoid rates. Buffalo and Washington stand not far from last year's figures, which in both cases were relatively low. In neither city is the 1916 rate as high as the 1914 rate or as the average for the preceding five-year period. New Orleans, on the other hand, exceeds its relatively high rate for 1915, which was itself slightly in excess of

1. The preceding articles were published May 31, 1913, p. 1702; May 9, 1914, p. 1473; April 17, 1915, p. 1322, and April 22, 1916, p. 1305.

2. The number of typhoid deaths has been sent us by the local officer of health, and the rates have been calculated on the basis of population estimates made according to the method of the U. S. Census Bureau. It may perhaps be noted that the figures kindly furnished us by the municipal officials include the deaths of nonresidents as well as residents occurring within the city limits. In some instances this undoubtedly gives an exaggerated impression of the amount of typhoid fever in a community, but at present statisticians are agreed that "the attempt to eliminate the deaths of nonresidents would often result in an understatement of the true mortality" (Bureau of the Census, Mortality Statistics, 1912, p. 13).

the preceding five-year average. Newark shows a considerable increase over the 1915 figure, but its rank is still excellent.

Los Angeles reports an exceedingly low typhoid mortality for 1916, almost making it the banner city of the group. Seattle, however, retains its primacy by a small margin. As pointed out last year, a part at least of the improvement in the Los Angeles rate may be attributed to the betterment in the water supply. Cincinnati and San Francisco also report marked reductions, and Minneapolis a very satisfactory one.

The most unfortunate city in this group during the past year has been Milwaukee, which has increased its rate from 4.5 to 14.9, and drops from third to ninth place. This great change for the worse was undoubtedly due to a general infection early in the year carried through the city water supply. The chlorination of the supply throughout 1915 was apparently highly effective, as noted in our last report, and no official explanation has been given for the apparent failure of the chlorination treatment in the month of January, 1916. Some suspicion was aroused locally by statements that sodium thiosulphate (hyposulphite) had been used, January 19, to neutralize the taste of the chlorin in the water; it seems conceivable that some mistake was made in this application, and that this led to the inhibition of chlorin action before all the intestinal germs in the water had been destroyed. It is

TABLE 2.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 2 (FROM 300,000 TO 500,000 POPULATION)

	Deaths from Typhoid per 100,000 Population 1916	1915	Average 1911-1915	Average 1906-1910
Seattle	3.0	2.5	5.7	25.2
Los Angeles	3.1	5.5	10.7	19.0
Cincinnati	3.4	7.8	7.8	30.1
San Francisco	3.4	9.4	13.6	27.3
Newark, N. J.	5.3	2.5	6.8	14.6
Minneapolis	5.8	7.1	10.6	32.1
Buffalo	10.9	9.9	15.4	22.8
Washington, D. C.	12.6	11.7	17.2	36.7
Milwaukee, Wis.	14.9	4.5	13.6	27.0
New Orleans	23.4	21.5	20.9	35.6

stated that the use of the sodium thiosulphate was followed by a sudden bacterial increase in the tap water. This explanation of the origin of the water-borne infection, however, does not seem to have received official acceptance. Similar instances have been reported in THE JOURNAL from time to time in which any interruption or interference with the process of chlorination of a bad water has given rise to severe typhoid outbreaks. Whatever the immediate cause, the water-borne epidemic in February was a serious one, resulting in upward of 300 cases and many deaths. The Milwaukee authorities are at a grave disadvantage in having to deal with a highly polluted water. Special vigilance is evidently demanded in water control in that city.

Group 3 (cities with from 200,000 to 300,000 population) continues for the most part its excellent record of 1915. The rates reached in 1916 are on the whole not far from those of the preceding year with the exception of St. Paul, Providence and Louisville, which report a marked improvement. Portland, Ore., still holds its place at the top of the list, and records a rate under 5. St. Paul also places itself for the first time on the honor list. Kansas City and Jersey City report typhoid increases. Rochester, Denver and Columbus record rates closely approximating the 1915 figures.

Indianapolis alone in this group has experienced a particularly bad typhoid year. Following the excessive amount of typhoid fever in December, 1915, there appears to have been a continuation of the excess in January, 1916. In August, 1916, another typhoid outbreak of considerable dimensions occurred, numbering, it is said, about 700 cases and over thirty deaths. There is no doubt that the situation in Indianapolis deserves more careful study than it has yet received. In spite of the excellent reputation which the Indian-

TABLE 3.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 3 (FROM 200,000 TO 300,000 POPULATION)

	Deaths from Typhoid per 100,000 Population 1916	1915	Average 1911-1915	Average 1906-1910
Portland, Ore.	4.6	5.2	10.8	23.2
St. Paul	4.9	7.4	9.2	18.3
Providence, R. I.	5.1	8.4	10.2	14.3
Rochester, N. Y.	5.1	6.0	9.6	12.8
Jersey City, N. J.	6.8	5.6	7.2	12.6
Denver	7.2	6.6	12.0	37.5
Louisville, Ky.	9.7	12.0	19.7	52.7
Kansas City, Mo.	10.6	7.2	16.2	35.6
Columbus, Ohio	13.4	13.3	15.8	40.0
Indianapolis	26.6	12.3	20.5	30.4

apolis water supply has had in the past, the appearance of several explosive epidemics of typhoid, and especially the outburst of epidemic diarrhea, call loudly for an explanation. Evidently something unusual occurred in the summer of 1916, as in the fall of 1915. What this was and how to prevent its recurrence is a subject of pressing concern for the citizens of Indianapolis. A searching investigation of the whole typhoid situation in that city seems to be called for.

In contrast to Indianapolis, Louisville has made a remarkably good record, dropping for the first time to a rate under 10, which is not only much the lowest point so far reached in Louisville, but the lowest yet reported from any southern city.

Some of the cities of Group 4 (from 125,000 to 200,000 population) have experienced rather unusual fluctuations in their typhoid rates. Birmingham, Richmond and Memphis are the worst sufferers. The high rate in the former city appears to be due in large part to a severe typhoid outbreak in June and July. This was thoroughly investigated by Dr. Lumsden of the United States Public Health Service and definitely attributed to ice cream made at one of the larger ice cream factories in Birmingham. It is thought that the infection of the ice cream originated in the use of

TABLE 4.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 4 (FROM 125,000 TO 200,000 POPULATION)

	Deaths from Typhoid per 100,000 Population 1916	1915	Average 1911-1915	Average 1906-1910
Paterson, N. J.	1.4	5.1	9.1	19.3
Spokane, Wash.	2.0	10.7	17.1	50.3
Worcester, Mass.	3.7	5.6	5.0	11.8
Oakland, Calif.	4.0	6.7	8.7	21.5
Omaha	5.1	3.7	14.9	40.7
Scranton, Pa.	5.4	10.4	9.3	31.5
New Haven, Conn.	8.0	18.3	18.2	30.8
Fall River, Mass.	10.9	11.8	13.4	13.5
Syracuse, N. Y.	12.2	5.9	12.3	15.6
Atlanta, Ga.	17.9	11.1	31.4	58.4
Toledo, Ohio	22.9	23.9	31.4	37.5
Richmond, Va.	24.1	12.7	15.7	34.0
Memphis, Tenn.	36.3	24.6	42.5	35.3
Birmingham, Ala.	42.6	33.7	....	....

infected milk or cream from some dairy or dairy farm outside Birmingham. While the ice cream supply was considered the predominating factor in producing the excessive number of typhoid cases in the early summer, the investigators believe that local factors other than ice cream were also operative. As a result of the outbreak and the consequent searching sanitary survey, it was recommended that all polluted wells and springs within the city be closed and that official supervision

of the public water supply be rendered more rigorous. Control of the milk supply was also especially recommended, and provisions for the proper disposal of excretal refuse were deemed essential. It is of excellent augury for the success of the campaign against typhoid in Birmingham that immediately following the large number of cases in June and July (558), the August cases should have dropped to eighty-one, a figure lower than for the same month in 1914 and in 1915. Birmingham seems to have been aroused by this epidemic to an understanding of its deplorable sanitary condition, and great improvement may be looked for in the immediate future.

The city of Memphis suffered from a serious explosive typhoid outbreak at almost the same time as Birmingham. Two hundred and fifty cases were reported in July, the number of new cases falling off to ninety-two in August. An infected dairy was considered the source of the outbreak. It is estimated that under the stress of the epidemic over 30,000 persons were vaccinated. Other southern cities unquestionably tolerate the same conditions which were primarily responsible for the Birmingham and Memphis outbreaks and should take warning from the disasters in those cities last summer. The causes of the excessive typhoid in our southern cities are now pretty well understood, and while the difficulties in the way of improvement are notably greater than in northern cities, they are by no means insuperable. We may look to Birmingham, Memphis, Atlanta and Nashville for a rapid and definite advance in their sanitary conditions.

Paterson holds the best place in Group 4, and records a rate with one exception (Cambridge, Mass.) the lowest in the country. Spokane, Worcester and Oakland also make an excellent showing. The cities of Scranton and New Haven report a marked reduction. The New Haven situation, long in need of betterment, seems to promise definite improvement.

Richmond, like Birmingham, had a serious summer epidemic, its rate for the year being almost doubled. Some uncertainty appears to surround the cause of the July-August epidemic. The public water supply seems to have been suspected at the time, but official inculpation of the water does not seem to have been made. One statement appears to place responsibility on the method of water chlorination, and attributes the outbreak to the irregular operation of the chlorination plant. If this is true, the Richmond outbreak, like the one in Milwaukee, calls attention again to the danger of depending on chlorin treatment without at the same time obtaining assurance as to the proper working of the apparatus. The temptation to regard as permanently safe a method which has been in successful operation for some time is great; but, as shown in the last few years, reliance on water chlorination under all circumstances may not be justified. Whatever the cause, the excellent typhoid record of Richmond in the past few years has been seriously injured.

No light has been shed on the Toledo problem in 1916. It is still a mystery why this prosperous northern city should suffer year after year so seriously from typhoid fever. There is no reason why investigation of the Toledo situation should not be immediate and thorough. Its position among American cities is not enviable.

The cities of Group 5 (from 100,000 to 125,000 population) make a particularly good showing, eleven of the number showing a decrease as compared with the rates for 1915. Cambridge heads the list with the lowest typhoid rate ever reported by a large city in this country and with a remarkable record for three consecutive years. We know of no other city of its size anywhere in the world which has so low a death rate from typhoid. Tacoma, New Bedford and Springfield also report very low rates, and Trenton maintains the good position it reached last year. Hartford and Albany join the ranks of the cities with a death rate less than 10, and exhibit a marked improvement over the average rates for the past ten years. Bridgeport has a somewhat increased typhoid mortality, but in view of the great increase in population in that city due to the influx of workers to munition factories, the problems of health control have become more difficult. Under the circumstances the typhoid rate for 1916 in Bridgeport must be regarded as creditable.

Salt Lake City and Camden show considerable increases over the preceding year, and Dayton a slight increase. The Lowell rate, on the other hand, is somewhat less, but is still above the average for the preceding five years. Grand Rapids reports some typhoid

TABLE 5.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 5 (FROM 100,000 TO 125,000 POPULATION)

	Deaths from Typhoid per 100,000 Population 1916	Average 1911-1915	Average 1906-1910
Cambridge, Mass.	0.9	1.8	4.0	9.8
Tacoma, Wash.	3.5	5.5	10.4	....
New Bedford, Mass.	4.2	18.2	15.0	16.1
Springfield, Mass.	4.7	10.6	17.6	....
Trenton, N. J.	6.3	6.4	22.3	....
Hartford, Conn.	6.3	18.3	15.9	19.0
Albany, N. Y.	7.7	12.6	18.6	17.4
Bridgeport, Conn.	9.0	5.1	5.0	10.3
Salt Lake City	10.2	7.0	13.2	....
Camden, N. J.	11.3	6.7	4.5	....
Lowell, Mass.	11.4	16.0	10.2	13.9
Dayton, Ohio	14.7	13.6	14.8	22.5
Grand Rapids, Mich.	15.6	24.6	25.5	29.7
San Antonio, Texas	16.9	19.2	29.5	....
Reading, Pa.	18.7	16.2	31.9	42.0
Nashville, Tenn.	27.3	35.1	40.2	61.2
Dallas, Texas	27.5	20.3	....	....

TABLE 6.—DEATH RATES FROM TYPHOID IN 1916

First Rank (Under 5.0)		Second Rank (5.0-10.0)		Third Rank (10.0-20.0)		Fourth Rank (Over 20.0)	
Cambridge, Mass.	0.9	Omaha	5.1	Salt Lake City	10.2	Toledo, Ohio	22.9
Paterson, N. J.	1.4	Providence, R. I.	5.1	Kansas City, Mo.	10.6	New Orleans	23.4
Spokane, Wash.	2.0	Rochester, N. Y.	5.1	Buffalo	10.9	Richmond, Va.	24.1
Seattle	3.0	Chicago	5.2	Fall River, Mass.	10.9	Indianapolis	26.6
Los Angeles	3.1	Newark, N. J.	5.3	Camden, N. J.	11.3	Nashville, Tenn.	27.3
Cincinnati	3.4	Cleveland	5.3	Lowell, Mass.	11.4	Dallas, Texas	27.5
San Francisco	3.4	Scranton, Pa.	5.4	Syracuse, N. Y.	12.2	Memphis, Tenn.	36.3
Boston	3.5	Minneapolis	5.8	Washington, D. C.	12.6	Birmingham, Ala.	42.6
Tacoma, Wash.	3.5	Trenton, N. J.	6.3	Columbus, Ohio	13.4		
Worcester, Mass.	3.7	Hartford, Conn.	6.3	Dayton, Ohio	14.7		
New York	3.8	Jersey City, N. J.	6.8	Milwaukee, Wis.	14.9		
Oakland, Calif.	4.0	Denver	7.2	Detroit	15.0		
New Bedford, Mass.	4.2	Albany, N. Y.	7.7	Grand Rapids, Mich.	15.6		
Portland, Ore.	4.6	Philadelphia	7.8	San Antonio, Texas	16.9		
Springfield, Mass.	4.7	New Haven, Conn.	8.0	Atlanta, Ga.	17.9		
St. Paul	4.9	Pittsburgh	8.6	Baltimore	18.0		
		Bridgeport, Conn.	9.0	Reading, Pa.	18.7		
		St. Louis	9.4				
		Louisville, Ky.	9.7				

diminution, but it is evident that the typhoid conditions in that city are not as satisfactory as in many other places.

Nashville, during the past year, has carried on a vigorous campaign against typhoid. It is said that over 20,000 persons have been vaccinated under the auspices of the health department, and many more by private physicians. There has also been a sustained endeavor to extend sewerage facilities in Nashville and to eliminate the dry closets. While much remains to be done, there is no doubt that the situation in this city is steadily improving under the energetic efforts of the physicians and health officials. Nashville reached a new low rate in 1916, and no longer has the highest typhoid rate in the country. Compared with the average rate for 1906-1910, its improvement has been remarkable.

TABLE 7.—AVERAGE DEATHS FROM TYPHOID PER HUNDRED THOUSAND IN EACH GROUP DURING 1916

Group	Number of Cities	Total Population	Number of Deaths	Average Deaths per 100,000
1, over 500,000	9	13,743,746	854	6.2
2, 300,000-500,000	10	4,053,281	344	8.5
3, 200,000-300,000	10	2,635,983	248	9.4
4, 125,000-200,000	14	2,250,991	330	14.7
5, 100,000-125,000	17	1,983,918	235	11.8
Total	60	24,667,919	2,011	8.1

Dallas shows an apparent increase for 1916 as compared with the preceding year. The typhoid history in this city for the previous decade is unavailable. Dallas now has a well trained director of public health, and betterment of the typhoid situation may soon be looked for.

TABLE 8.—TOTAL AVERAGE TYPHOID DEATH RATE (1910-1916)

	Total Population (57 Cities)* Estimated by U. S. Census Bureau Methods	Typhoid Deaths	Typhoid Death Rate per 100,000
1910	20,996,035	4,114	19.59
1911	21,545,014	3,391	15.74
1912	22,093,993	2,775	12.56
1913	22,642,972	2,892	12.77
1914	23,191,951	2,408	10.38
1915	23,740,930	2,068	8.71
1916	24,205,359	1,842	7.61

* Three cities are omitted from this summary because data for the full period are not available.

In 1916, thirty-three cities had a lower typhoid rate than in 1915 and twenty-six a higher; thirty-five cities had a typhoid rate under 10, as compared with 32 in 1915. Sixteen cities had a death rate under 5 in 1916, while only five cities were under that limit in 1915, four in 1914 and one in 1913. In 1916 four cities reached the very low rate of 3.0 or less.

A Famous Roman.—Scribonius Largus, a Roman physician who lived during the reigns of Tiberius and Claudius (14-54 A. D.), owes his celebrity to the fact that he wrote and published (in 47 A. D.) a book containing a collection of the best medical formulae and popular recipes known at that time. He appears to have had a large private practice and to have spent a considerable portion of his professional life in the service of the army. He accompanied the Emperor Claudius, for example, in his campaign against Britain (43 A. D.), and the book which he wrote, and which has just been mentioned, was dedicated by him to that emperor. According to Neuburger, Scribonius is to be credited with having been the first to describe correctly the proper manner of obtaining the drug known as opium, and also the first to recommend, in the treatment of severe headaches, the employment of electric shocks as communicated by the fish called the "electric ray." —Albert H. Buck, The Growth of Medicine.

Therapeutics

DISTURBANCES OF THE KIDNEYS

(Continued from page 781)

Chronic Nephritis

Some of the causes of this disease are:

Unresolved acute nephritis.
Repeated attacks of acute nephritis.
Repeated irritations of the kidneys, such as result from repeated anesthesias, athletic strain, and frequent severe chilling of the body.
Overindulgence in meat and canned foods, repeated ptomain poisoning, and prolonged use of foods preserved with sodium benzoate or boric acid.
Intestinal indigestion.
Overindulgence in alcohol, especially beer. (Although alcohol has not been proved to be a direct cause of nephritis, it acts as a predisposing cause by disturbing the gastro-intestinal digestion and the liver.)
Prolonged hypertension.
Cardiac insufficiency.
Pregnancy.
Abdominal tumors.
Loose kidney.
Syphilis.
Kidney infection, especially of the pelvis of the kidney.
Gout.
Arteriosclerosis.
Chronic lead poisoning.
Long continued use of mercury, arsenic, some synthetic drugs, and some coal-tar drugs.
Repeated exposure to severe cold.

SIGNS OF INCIPIENT CHRONIC NEPHRITIS

Besides the more scientific tests of kidney function, many clinical signs and symptoms indicate the beginning of or the later stages of chronic nephritis. Acute nephritis invariably, and chronic diffuse nephritis generally, present so many urinary evidences that the diagnosis is unmistakable. The so-called chronic interstitial and arteriosclerotic nephritis begins and develops so insidiously, at times without urinary signs, that associated symptoms and conditions are of importance in making a diagnosis. Predisposing causes are: chronic congestion of the kidneys due to insufficiency of the circulation or to some abdominal cause; continued intestinal indigestions, as evidenced by indican in the urine; hypertension with all of its associated symptoms, as attacks of polyuria, arising at night once or more to urinate, cardiac hypertrophy, attacks of palpitation, slight dyspneic attacks, momentary dizziness, and eye disturbances; gouty symptoms; a history of overfeeding, especially of proteins; an alcoholic history; excessive smoking; severe athletic work or other physical tension in earlier life; previous attacks of nephritis; repeated pregnancies, especially if kidney congestion has occurred during this condition; and history of serious infection or disturbance of the urinary tract. A previous history of any of these conditions demands that the urine be examined at regular intervals for albumin and casts, and that the twenty-four hour urine excretion be determined. As chronic nephritis often develops slowly, proper advice and care will, in many instances, long postpone insufficiency of the kidneys.

The importance of the diminution of the chlorid excretion is understood, as is also the importance of preventing intestinal indigestion and of prescribing food which does not cause indican or an increase of sulphate to appear in the urine. If there is an increase

of ammonia in the urine it may indicate liver disturbance.

The diet being arranged for the individual, repeated chilling of the body prevented, severe exercise proscribed, alcohol prohibited, tobacco prohibited or allowed in moderate quantities, the skin kept moist and healthy and able to function normally, and constipation prevented, incipient nephritis may for a long time remain in this stage.

On the other hand, as repeatedly stated, traces of albumin and hyalin and granular casts do not necessarily denote that chronic nephritis is developing. They denote some congestion of the kidneys, however, the cause of which should be sought, as these repeated congestions or irritations lead to future chronic inflammation. Even when an albuminuria, with or without casts, persists for some time in a condition not severe enough to be termed a nephritis, the congestion may entirely disappear, the injured epithelium entirely recover and the kidneys become normal, remaining so perhaps for years or for the rest of the patient's life. It seems probable that slight congestion of the glomerular epithelium may permit an albumin leak, while considerable degeneration of the epithelium of the tubes may occur without accompanying albuminuria.

Some portion of the kidney may be the source of considerable albumin and numerous casts and yet may entirely recover without interfering with the total kidney excretion or without showing symptoms of a real nephritis. The extent of the infection and the probable prognosis can be ascertained by tests of function, several twenty-four hour urine examinations, the condition of the circulation, the blood pressure and other associated symptoms, especially head symptoms, and also by an examination of the blood for nonprotein nitrogen retention.

PROGNOSIS IN CHRONIC NEPHRITIS

The height of the blood pressure is not a definite guide as to the severity of nephritis, but is an important indication, as a low blood pressure is rarely found when the kidneys are insufficient; though it may occur when the kidney inflammation is secondary to cardiac insufficiency. Although the contrary has been repeatedly asserted, cases have occurred in which the systolic blood pressure has been over 200 mm. and there has been no kidney insufficiency nor has one developed in months, or perhaps years. Overstimulation of the suprarenals by some hormone or by some disturbed excretion from the kidneys in nephritis may cause high blood pressure. Hypertension may be due to a certain extent to retained water and solid constituents in the blood in nephritis, this overdistention causing increased vascular pressure and perhaps compensatory hypertrophy of the heart. These retained substances in the blood may also irritate the walls of the blood vessels to contraction.

Although repeated examinations of the urine will almost invariably show, sooner or later, albumin or casts, or both, uremia may occur when they are entirely absent. Generally, however, the greater the number of casts and the greater the amount of albumin, the more severe the chronic nephritis. Large amounts of albumin may occur in orthostatic or lordotic albuminuria without a real nephritis.

A more positive indication of the condition of the kidneys than the amount of albumin and casts is the amount of nonprotein nitrogen in the blood. One hundred c.c. of blood should normally not contain much more than 30 mg. of nonprotein nitrogen. In uremia there is always retained nonprotein nitrogen, and in sudden coma in patients not previously observed when the urine apparently is negative, or when there is some suppression, examination of the blood for retained nitrogen will determine whether nephritis is a cause, or an associated cause, of the coma. However, the type of nephritis cannot be diagnosed by the amount of retained nonprotein nitrogen.

As elsewhere stated, the phenolsulphonephthalein output—50 per cent. of which should be normally excreted in two hours—may be normally excreted even in the presence of a moderately advanced nephritis. On the other hand, if the phenolsulphonephthalein is very slowly excreted, the kidneys are markedly impaired, either temporarily or permanently. In congestion caused by circulatory failure this impaired function may gradually be restored as the circulation improves. A diminished sodium chlorid excretion can be ascertained by testing, but may be inferred to accompany edema. If the kidneys are seriously impaired, nitrogen retention, as shown by the examination of the twenty-four hour urine on a known diet, or by the urea feeding test, is of serious import, although the type of nephritis cannot be determined by this test.

Evidences of kidney insufficiency other than the signs described are mental irritability, headaches, dizziness, periods of depression, increased muscle tension, an unexplainable fatigue, and weariness without much exertion, momentary deafness or blindness, or more serious affections of the eyes, and momentary attacks of aphasia. The mental powers may be seriously impaired, the patient finding it difficult to concentrate; memory and judgment may be impaired. These symptoms are characteristic of general arterial or cardiovascular-renal disease. More serious mental depression, approaching melancholia, may signify chronic nephritis.

Acidosis apparently is a frequent cause of dyspnea in nephritis; that it is the only cause is probably not true. Peabody,[93] who studied the relation of acidosis to dyspnea in kidney disease, concludes that a mild acidosis in chronic nephritis is compensated by the increased urinary output of acid. In uremia, acidosis is present, and in terminal uremia it occurs in a marked degree. He did not find that acidosis bore any relation to the nonprotein nitrogen retention or to the phenolsulphonephthalein output. Occasionally acidosis may be present without dyspnea.

Exophthalmos may occur in chronic nephritis, owing perhaps to some toxin acting on the sympathetic nervous system.

Chronic nephritis may be so insidious that the patient may apparently be well for years during the slow development of the disease, until retinitis, cardiac failure, apoplexy or uremia suddenly supervenes. Others, with or without albumin in the urine, may succumb to a sudden fatal attack of angina pectoris. Some patients suffering with chronic nephritis may develop the following symptoms: anemia, loss of weight (unless there is marked edema), low blood pressure, lack of strength, followed by severe headaches, resulting in death from acute uremia; others may have practically no head symptoms, and succumb to dropsy and heart failure.

(To be continued)

93. Peabody, F. W.: Studies on Acidosis and Dyspnea in Renal and Cardiac Disease, Arch. Int. Med., August, 1914, p. 236.

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SATURDAY, MARCH 17, 1917

THE LYMPHATICS AND INFECTIONS OF THE URINARY TRACT

The importance of the lymphatic system in relation to various processes of a physiologic as well as a pathologic character has never been fully appreciated. Compared with the innumerable investigations of the blood-vascular channels, the studies of the lymphatics shrink into relative insignificance. Presumably this is due to the greater difficulties which the accurate examination of lymphatic function presents, and perhaps also in part to the more immediate and obvious relations of the blood circulatory system to the activities of living organs and tissues. No one can charge the deficit in our knowledge of the lymphatics to the novelty of the subject, for more than a century has elapsed since the lymph system in its entirety was described by Mascagni.

An instance of the little appreciated significance of the lymphatics is disclosed in the study of ascending infection of the kidney. As a rule, this has been believed to occur either through the lumen of the lower urinary tract and the ureters or by the less probable way of the blood vessels of the ureters. That a migration of micro-organisms upward from these channels and the renal pelvis might occur when the ureter is obstructed so that the urine stagnates cannot be denied. But it is far less probable that a transportation of infectious agencies to the upper urinary tract would take place against any secretory current such as ordinarily is present within the ureter without obstruction.

The existence of lymphatics in close approximation to the urinary structures has long been known.[1] An extensive network of lymphatic vessels and channels exists in the mucosa and submucosa, in the external coats of the bladder and the ureters, and in the entire structure of the kidney. This network in the ureter anastomoses freely with the lymphatics of the bladder at one end, and with the lymph apparatus of the kidney at the other end. At its lower end the system communicates also with the lymphatics of the pelvic structures, in both the male and the female.

These facts at once suggest that infections of the bladder or lower ureter may reach the renal pelvis or the kidney by way of the mural lymphatics as well as by the paths already referred to. An appreciation of the importance of this was clearly recognized by Sweet and Stewart[2] of Philadelphia in their attempts to devise an operation for the successful anastomosis of the ureters with the bowel. Among the recognized difficulties of this procedure of uretero-intestinal implantation that is occasionally rendered desirable by disease of certain regions of the urinary tract are general peritonitis, cicatricial contraction of the opening into the bowel, and ascending infection of the kidneys. The last is of the greatest importance. The Philadelphia surgeons soon suspected that the pathway along which the objectionable infection ascends is in the lymphatic system of the ureter and kidneys, rather than in the blood vessels or the lumen of the ureter. Indeed, they came to the conclusion in 1914, as the result of their experimental studies, that "the anastomosis of the ureters with the bowel would not seem to hold out much promise," for every attempt was blocked by the ease and rapidity with which infection following operative procedure enters the lymphatic system of the ureter.

More recently Eisendrath and Schultz,[3] working in the Nelson Morris Memorial Institute for Medical Research of the Michael Reese Hospital, Chicago, have attempted to ascertain experimentally whether or not the upper urinary tract becomes involved by way of the lymphatics in those cases in which the bladder is the seat of infection. Both clinical and experimental evidence indicated that almost complete obstruction to the free passage of urine is necessary for the ascent of infection by way of the lumen of the urinary tract. Eisendrath and Schultz showed that infection set up by the introduction of bacteria into the bladder without injury or obstruction may pass upward by means of the interstitial lymphatics of the ureter. The degree of involvement depends, as always, on the virulence of the micro-organism and on the susceptibility of the subject. When the kidney tissue is involved in ascending infection brought about experimentally, as described, the path of travel is from the subepithelial tissue of the pelvis to the kidney by way of the intertubular and perivascular lymphatics. From the kidney the perirenal tissues may become involved through the capsular lymphatics which anastomose with those of the cortex.

These observations may explain the genesis of many of the cases of pyelitis and pyelonephritis which complicate a cystitis. Furthermore, the Chicago investigators even believe that the free anastomosis between the

1. Sakata (Ueber den Lymphapparat des Harnleiters, Arch. f. Anat., 1903, p. 1) cites the older literature. Kumita: Lymphgefässe der Nieren- und Nebennierenkapsel, ibid., 1909, p. 49; Ueber die Lymphbahnen des Nierenparenchyms, ibid., 1909, p. 94. Bauereisen, A.: Ueber die Lymphgefässe des menschlichen Ureters, Ztschr. f. gynäk. Urol., 1911, 2, 235.

2. Sweet, J. E., and Stewart, L. F.: The Ascending Infection of the Kidneys, Surg., Gynec. and Obst., 1914, **18**, 460.

3. Eisendrath, D. N., and Schultz, O. T.: The Path of Involvement in Ascending Infection of the Urinary Tract, Jour. Med. Research, 1917, **35**, 295. Lymphogenous Ascending Infection of the Urinary Tract, The Journal A. M. A., Feb. 17, 1917, p. 540.

lymphatics of the broad ligament and those of the ureter makes it possible for infection to travel directly from the uterus and adnexa to the ureter, and from there to the renal pelvis and kidney. Pyelitis and pyelonephritis, not secondary to cystitis, may therefore also be the result of lymphatic transport of infection from the pelvic organs in the male and female, and from the lower intestinal tract. This, Eisendrath and Schultz tentatively contend, would explain many of the cases of pyelitis of pregnancy and of the puerperium in which there are no traces of cystitis either bacteriologically or in cystoscopic examination. As a practical precaution they emphasize the necessity of a minimum of trauma and a maximum of asepsis in manipulations on the lower urinary tract, especially of the bladder and ureters, since organisms can enter the submucous lymphatics even though the epithelial lining of the bladder and ureter is intact, being carried upward by the lymphatics to the kidney. The new emphasis on the lymphogenous route of infection opens up many speculations that have not received consideration in relation to the urinary tract.

CURRENT VIEWS REGARDING THE TONSILS AND THEIR SURGICAL REMOVAL

Nowadays when any organ of the body attains a previously unsuspected importance so that considerable professional attention is concentrated on it, the circumstances is soon reflected in the interest and expectations of the layman. This is seen, for example, in the popular attitude toward the tonsils and adenoids. Few untutored persons have any conception as to the purpose, not to say the location and anatomic relations, of these lymphoid tissues. The physician may counsel the removal of one of the structures with a clear understanding that he is urging what is, in a sense, an experimental operation which may remove a possible cause of disease in other organs. The layman, encouraged by the apparent innocuousness of the operative procedure, soon begins to look on tonsillectomy as a sort of panacea for the most diverse ills; and somehow this state of mind occasionally seems to weigh in the balance with the professional man himself. That the uses of these lymphoid structures are so little understood is no reason for counting every prominent tonsil or adenoid in persons of school age as a defect. Indeed, there seems to be a wholesome reaction against the operations on tonsils in youth merely because they are prominent and noticeable. At the Johns Hopkins Hospital, for example, the practice is to regard the tonsils and adenoids in children as physiologically important parts of the mechanism which protects the lower air passages from dust and organisms.[1] If there are no mouth-breathing, no evidence of damage to the ears, no chronic enlargement of the glands of the neck, no cystic condition of the adenoids known as Thornwald's disease, and none of the so-called "reflex neuroses," the removal of adenoids regardless of their size or appearance is not recommended.

On the other hand, recent years have witnessed a growing interest in management of diseased tonsils and a widespread appreciation that the germ of tonsillitis may hit in many spots far removed from the local seat of obvious disorder. Tonsillar and nasopharyngeal infections have of late frequently become related, for example, to infectious and rheumatoid arthritis, myositis and acute rheumatic fever, to chorea, to hyperplasia of the cervical glands, and even to nephritis. If these relationships and other indications of the involvement of the tonsils as portals of entry for harmful micro-organisms could be convincingly established, the indications for the removal of the tonsils both as a prophylactic and as a therapeutic measure would become clearer and more rational. It is of unusual value, therefore, to have available a carefully digested study of the relation of tonsillar and nasopharyngeal infections to general systemic disorders, based on 1,000 cases in which operation was performed at the Johns Hopkins Hospital during the past five years.[1] An added importance is lent by the fact that these operations were not done in a haphazard way in hurried dispensary service without experienced anesthetists or assistants; they were performed under the rigorous routine of a surgical ward, and the cases were followed up in order to learn the subsequent history with respect to disorders supposed to be secondary to a chronic focus of infection in the upper air passages.

As a result of the experience now collated, Dr. Crowe and his associates have reached certain tentative conclusions which may be helpful in the contemplation of tonsillectomy. They assert that the operation should never be undertaken during the acute stage of tonsillar inflammation, as a cerebral abscess may result. Diabetes is as much a contraindication for tonsillectomy as it may be for any operation necessitating general anesthesia. Tonsillectomy is rarely of benefit in the chronic deforming types of arthritis, in many cases probably doing more harm than good. The Baltimore surgeons are further convinced that nothing is to be gained from a tonsillectomy during the acute stage of chorea, acute rheumatic fever or endocarditis. Their experience shows that even after the nose and throat have been put in normal condition by operative measures these diseases may recur. In any event the tonsils are not the only portals of entry for the etiologic organism, and their removal in an interval free from symptoms can be justified only on the plea of preventing further cardiac lesions which may result from subsequent acute tonsillitis. The frequency of heart and joint defects in chorea may justify such a prophylactic measure.

1. Crowe, S. J.; Watkins, S. S., and Rothholz, Alma S.: Relation of Tonsillar and Nasopharyngeal Infections to General Systemic Disorders, Bull. Johns Hopkins Hosp., 1917, **28**, 1.

In infectious arthritis in which the periarticular changes predominate, and perhaps also in myalgia, the promise of helpfulness from tonsillectomy is greater. In the early stages of glomerulonephritis it may also be worthy of some consideration. The tonsils are the most common site of the chronic infections which give rise to a hyperplasia of the deep cervical lymph glands near the angle of the jaw. The enlargement of the glands will rarely subside after treatment of carious teeth and alveolar abscesses alone. It seems advisable, therefore, under such conditions to consider the removal of the tonsils in cases of persistent palpable glands at the angle of the jaw, particularly if the patient has some general systemic disorder. The majority of the enlargements are apparently due to a chronic pyogenic infection which will subside after tonsillectomy. The others are due, as a rule, to persistent tubercle bacilli.

Obviously the advisability of a tonsillectomy in any individual case depends on the malady and the general condition of the patient. As the Baltimore investigators express it, tonsillectomy alone will not cure tuberculous cervical adenitis, arthritis or glomerular nephritis. It is necessary in such cases to apply general hygienic measures as well, so as to increase the patient's resistance. If the tonsils are the primary focus of infection, their removal in suitable instances may materially alter the prognosis by preventing a constant reinfection. Skilful surgery is indispensable. A partial occlusion of the crypts, resulting from an incomplete tonsillectomy, as sometimes happens, may actually aggravate the symptoms of infection by producing a mechanically made focus of trouble. Despite the many uncertainties and unsolved problems which still exist, however, Crowe and his collaborators state that their records "tend to support the evidence of Billings and others in regard to the importance of focal infections in many of the general disorders seen by the internist, the pediatrician, and the general surgeon."

THE RELATION OF ATMOSPHERIC HUMIDITY TO HEALTH

The importance of atmospheric conditions in determining the heat regulation of the human body has been emphasized by the researches of the last ten years. Scientifically conducted experiments have shown that a large part, if not all, of the discomfort and ill effects brought about by so-called bad ventilation is due to interference with the normal activity of the heat-regulating mechanism. Atmospheric temperature is an important factor in causing physiologic disturbance, but atmospheric humidity also has a large share.

Perhaps the most readily explainable set of changes is that produced by high humidity combined with high temperature. The presence of an excess of moisture in the air naturally lessens evaporation and so leads to a greater rush of blood to the skin in the endeavor to maintain the normal heat equilibrium of the body. Other effects follow. The mucous membrane of the respiratory tract is affected, causing marked swelling and redness of the nasal mucosa. A decrease in the ability as well as the inclination for physical labor has been shown by the exact experiments of Lee and Scott. The dilation of the cutaneous blood vessels undoubtedly causes anemia of the brain, but a definite connection with the accuracy and amount of mental work has yet to be demonstrated. The influence of high room humidity on the health of laundry workers and others engaged in various industrial occupations has long been a matter of observation, and is now given especial consideration in all attempts to establish modern ventilation standards. High humidity combined with high temperature is measurably detrimental.

Cold air with a high moisture content has a depressing effect on the human organism, but the factors concerned are not well understood. Some writers have maintained the existence of a direct connection between house dampness and tuberculosis. Other diseases, such as rheumatism, are commonly supposed to be fostered by a cold damp climate. Cellar dwelling is proverbially unwholesome. In individual instances vitality seems to be lowered and predisposition to infection increased by exposure to humid cold. There is no doubt that the human mechanism works at a disadvantage when placed in cold, moisture-laden air, even though the precise nature of the derangement is not known.

Cold dry air is generally considered healthful and stimulating. Metabolic processes are active, and if the body is properly protected against excessive heat loss, sensations of well-being are dominant. There is little exact physiologic evidence bearing on this condition. Miller and Noble[1] have shown that respiratory infection of rabbits with *Bacillus bovisepticus* (snuffles) is favored by chilling the animals after they have been accustomed to heat.

Dryness combined with high temperature is commonly deemed injurious. This is the combination found in desert climates and in many artificially heated dwellings in northern climates in winter. The dry, hot atmosphere induces restlessness and "nervous" feelings, as well as drying and irritation of the skin and mucous membranes. Susceptibility to colds is said to be increased in indoor dwellers in a hot, dry atmosphere, although a similar effect does not seem to be associated with the aridity of desert climates. Unfortunately there is little known about the optimum relation of temperature and humidity. Climatic studies are difficult to evaluate in this connection since other factors, sunlight, wind and dust, may obscure or neutralize the influence of relative humidity per se.

1. Miller, J. A., and Noble, W. C.: The Effects of Exposure to Cold Upon Experimental Infection of the Respiratory Tract, Jour. Exper. Med., 1916, 24, 223.

It is obvious, too, that proper compensation must be made for the evaporation of water from the body in a hot, dry atmosphere and the water intake suitably regulated. There is some uncertainty as to how far the effect of the much berated "life in steam-heated apartments" is due to dryness and how far to other factors, such as the relative winter inertia and lack of exercise, the high room temperature—apart from dryness—that is maintained, and especially the sudden changes from high to low temperature and the reverse—often amounting to from 50 to 60 degrees—that are incurred in passing back and forth between dwelling, office and the wintry streets. In point of fact, we do not know what constitutes the ideal combination of humidity and temperature for maintaining working efficiency. There is no doubt that the introduction of some moisture—say a relative humidity of from 40 to 50 degrees—into the air of the ordinary offices and living rooms in winter gives the atmosphere a balmy quality and conduces to comfort. Comfort alone, however, is not an absolute criterion. It is the opinion of some that the definitely injurious effects of a dry indoor atmosphere in winter have been exaggerated, and that the maintenance of a lower temperature, greater bodily activity and other measures of personal hygiene are of greater importance than the use of "humidifiers." Until the relations of humidity to health and to working efficiency have been determined more exactly than at present, attempts to increase the amount of moisture in the air of dwelling rooms must be more or less tentative and experimental. It is to be hoped that the physiologists will soon be able to provide us with further information about this important matter.

SUGAR TOLERANCE IN PITUITARY DISORDERS

In their experimental studies on the functions of the pituitary gland, Cushing and his collaborators, among others, have presented data to indicate a relation of the hypophysis to sugar tolerance in the organism. Summarized, these indicate that conditions of overactivity or functional hyperplasia of the posterior lobe (pars nervosa et intermedia) foster glycogenolysis and occasion a lowered sugar tolerance if not an actual glycosuria, whereas in conditions of lowered activity or hypoplasia the carbohydrate tolerance becomes distinctly higher than the normal. It has been maintained that the posterior lobe secretion is chiefly concerned in these deviations from the normal in the tolerance for carbohydrates. The experiments seemed to show that when the assimilation for carbohydrates is greatly increased as the outcome of such dyspituitarism, it can be promptly lowered by the coincident intravenous or subcutaneous injection of posterior lobe extract. This extract, furthermore, has a pronounced effect in lowering the sugar tolerance of the normal animal, in which it may even cause glycosuria when given in sufficient dosage.[1]

Such observations might reasonably be expected to have considerable therapeutic significance on the clinical side. Cushing has maintained that on the basis of existent carbohydrate tolerance it should be possible to determine whether a particular case of obvious hypophysial disease is associated with an overactivity or underactivity of the posterior lobe, and thus whether or not it is advisable to administer glandular extract. His clinical series make it apparent that in the early stages of acromegaly the sugar tolerance is apt to be low but that later in the disease there is an acquired overtolerance, and furthermore, that a high assimilation limit may be expected from the outset when the gland is compressed or obstructed by a superimposed tumor which brings about alterations comparable to those of a primary posterior lobe hypoplasia. Hence it may be assumed that in the early stages of acromegaly glandular therapy is contraindicated, whereas later in the disease its use would seem to be highly advisable.

In the experiments on animals, certain associated symptoms are apt to accompany the increased tolerance for carbohydrates. One of these is a tendency toward the acquirement of a generalized adiposity, which suggests the conversion of the stored sugars into fat. Thus, during the tests to establish the carbohydrate tolerance, whether in experimental or clinical cases of posterior lobe deficiency, there often occurs a notable accretion in body weight.

The underlying facts with respect to sugar tolerance in most of these cases, both experimental and clinical, were obtained by the oral administration of sugar for the tests. This procedure has been criticized in the past on the broad principle, pointed out by Blumenthal,[2] that the utilization of sugar by the tissues is expressible only in terms which apply to velocities, for example, as unit weight of sugar, per unit weight of tissue, per unit weight of time. The rate at which sugar is brought to the tissues must therefore be controlled if it is desired to measure its rate of utilization. This necessitates precise knowledge of the rate at which it enters the blood; but when a sugar is given by any method entailing absorption as a preliminary to its entrance into the blood, the latter rate is subject to uncontrollable variations. The most nearly exact method of determining sugar tolerance must therefore consist in direct intravenous injection.

The customary clinical practice consists in administering by mouth 100 gm. or more of glucose dissolved in water or lemonade, and to speak of a low tolerance if glycosuria results from this dose. If 200 gm. can be thus ingested without provoking an output of sugar

1. Goetsch, E.; Cushing, H., and Jacobson, C.: Carbohydrate Tolerance and the Posterior Lobe of the Hypophysis Cerebri, Bull. Johns Hopkins Hosp., 1911, **22**, 165.
2. Blumenthal: Beitr. z. chem. Phys. u. Path., 1905, **6**, 329.

in the urine, the glucose tolerance is said to be high. Woodyatt, Sansum and Wilder[3] of the Sprague Memorial Institute, Chicago, have contended that there can be no doubt of the correctness of the principle stated by Blumenthal or of the insuperable difficulties which lie in the way of accurate management of the power of the tissues to utilize sugar when methods are used in which it is impossible to control the rate of entry of sugar into the blood. If the sugar is given by mouth, the rate of absorption will depend on variable factors entirely beyond control, and when the subcutaneous or intraperitoneal routes are chosen, the same difficulty is encountered. A tolerance limit obtained by such methods is at best only the resultant of absorption and utilization; and yet, since the appearance of Blumenthal's article, writers other than those quoted above have failed to appreciate the soundness of his views, and continue in their adherence to absorption methods.

By the use of an ingenious injection device applicable to man,[3] it has become easy to find the rate of injection which just equals the rate of utilization or the tolerance limit. Normal resting adult men and women of average size, weight and nutrition begin to excrete abnormal quantities of glucose in the urine when the injection rate into the vein is above 0.8 gm. and below 0.9 gm. per kilogram of body weight per hour. By means of their injection technic the Chicago investigators have studied the carbohydrate tolerance, in the sense just defined, in cases of hypophysial disease, including acromegaly, gigantism and dyspituitarism, showing the Frölich syndrome. As an outcome, the glucose tolerance of all these cases was found to lie close to the normal limits. Three showed a bare trace of sugar in the urine after the injection of 0.8 gm. per kilogram per hour, and all gave a definite glycosuria after receiving 0.9 gm. per kilogram per hour. These results are in disagreement with those obtained when the oral administration is used, and suggest, as in the case of myxedema, that the increased tolerance of such patients for sugar given by mouth may be due rather to a retarded absorption from the bowel than to any anomaly of the intermediate metabolism, as certain writers have assumed.

The number of cases examined by the newer method is far too small to permit a final adverse critique of the teachings of Cushing and others. It seems important, therefore, that the factor of tolerance, so important for a correct interpretation of the underlying physiologic disturbance and an application of therapeutic measures, should soon be more conclusively settled by renewed investigation in the directions obviously indicated. There is no serious hindrance to the application of the injection technic in human cases.

3. Woodyatt, R. T.; Sansum, W. D., and Wilder, R. M.: Prolonged and Accurately Timed Intravenous Injections of Sugar, The Journal A. M. A., Dec. 11, 1915, p. 2067. Wilder, R. M., and Sansum, W. D.: d-Glucose Tolerance in Health and Disease, Arch. Int. Med., February, 1917, p. 311.

A DEBATED FEATURE OF WOUND HEALING

In the technic of cultures of living tissues it has become customary to embed the isolated cells in a medium of blood plasma, as the satisfactory growth of the surviving protoplasmic structures seems to be dependent on some mechanical support, such as is afforded by the fibrin network of a blood clot. Not long ago, Baitsell[1] observed that in such living cultures of tissues there occurs, in many instances, a transformation of the plasma clot in which the living tissue is embedded. This transformation results in a consolidation or fusion of the elements of the fibrin net and a consequent formation from it of a fibrous tissue which is identical in its form and structure and in many of its staining reactions with a regular collagenous connective tissue.

Such a reaction, whereby cells can transform a fibrin clot by direct intercellular action into a permanent fibrous connective tissue, presented an unusual and decidedly novel view of the development of such tissue. It represented the direct transformation of the fibrin clot into a new fibrous tissue without any intracellular action. It suggested that the connective tissue cell is not primarily the active agent, but that some sort of chemical processes outside the cell body, perhaps some reaction like that in blood coagulation, was responsible for the production of connective tissue fibers.

Baitsell[2] has attempted to substantiate his views further by a study of the formation of fibrous tissue in wound healing. Here a fibrin clot is regularly formed as a part of the repair process; and Baitsell has suggested that subsequently the same change goes on as has been described by him in the isolated tissue cultures. He states that the newly formed fibrous tissue which fills the wound space is apparently identical in appearance, structure, function and staining reactions with regularly formed permanent connective tissue. This conclusion is in sharp contrast with the generally prevailing views[3] that the fibrin, in wounds healing by first intention, forms a temporary tissue which holds the wound surfaces in place and stops up the wound, thus preventing infection. Isater the fibrin disappears, not by liquefaction, but through an actual consumption by the new tissue cells, which show a positive chemotropism to the fibrin mass and are thus attracted into the fibrin clot in large numbers. The permanent tissues which go to fill the wound space are then formed by these cells through an intracellular action.

Baitsell's interpretation of the change in the fibrin clot as a transformation of fibrin into true fibrous tissue was based on the physical character of the unstained fibers and their reaction to connective tissue

1. Baitsell, G. A.: The Origin and Structure of a Fibrous Tissue Which Appears in Living Cultures of Adult Frog Tissues, Jour. Exper. Med., 1915, **21**, 455.

2. Baitsell, G. A.: The Origin and Structure of a Fibrous Tissue Formed in Wound Healing, Jour. Exper. Med., 1916, **23**, 739.

3. Marchand, F.: Der Process der Wundheilung, Stuttgart, 1901, pp. 52-55.

stains. Chemical tests were also applied. Lambert,[4] who has reinvestigated the question, has announced his conclusion that the only support for Baitsell's transformation idea consists of results obtained with a modified stain which does not differentiate fibrin and fibrous tissue. Chemical tests and reactions with all three of the differential connective tissue stains in general use show that no such transformation takes place. For the present, therefore, we may remain justified in the belief that the fibrin which early fills wounds forms only a temporary scaffolding which is removed later — not, however, by the postulated direct conversion into permanent collagen fibrils, such as are found in the healed scar. The genesis of these is to be sought in the work of connective tissue cells.

Current Comment

PROGRESSIVE LEGISLATION IN ILLINOIS

The passage of Governor Lowden's consolidation bill[5] must be regarded as a most important state legislative achievement. This measure, known popularly as the consolidation bill and legally as the Civil Administrative Code of the State of Illinois, completely reorganizes the state administrative machinery. It abolishes or consolidates about 130 boards, commissions, bureaus and special committees which have been created by legislative enactments during the last fifty years. Like most of our states, Illinois followed no definite program or policy in the development of the administrative branch of her government, and as a result there was a hopeless tangle of boards and commissions, with conflicting and overlapping functions and duties, without any clearly defined responsibility for different functions, and with little, if any, coordination. The bill reorganizing the state executive offices passed the senate unanimously and was adopted by the house with only three dissenting votes, in spite of the fact that it put an end to many offices and sinecures dear to the hearts of politicians. While the entire law is of the greatest importance to the state, physicians are naturally most interested in its public health and medical licensure features. A department of health with a director of public health at the head takes the place of the old board of health. This department not only takes over the powers and duties of the state board of health under previous laws, but also has conferred on it broader functions than the state board possessed. A department on registration and education takes over the examining and licensing of all professions, occupations and trades coming under state control. The principle on which the examining and licensing of physicians is based is essentially that the state regulation of the practice of medicine is an educational and not a sectarian function, and that it therefore is a function of the educational authorities. The responsibility for examining and licensing physicians, as well as all others who desire to treat the sick, by any method, for compensation, as a means of livelihood, is taken off the shoulders of the medical profession and transferred to the people, operating through the educational machinery of the state. This is a most important step in the development of medical legislation, which it is hoped will not only do away with the necessity of specific sectarian legislation, special boards and conflicting standards, but also make unnecessary a large amount of the medicopolitical activity of the past. The provisions for the appointment of educational examiners under the direction of the department of education, for the preparation of questions on practice peculiar to any school, does away with the necessity of special examining boards, and will doubtless lead to recognition of the principle that all persons desiring the same rights and privileges must conform to the same educational standard. Governor Lowden has not only given the state of Illinois an opportunity for developing a modern health machinery; he has also relieved the physicians of the state of the self-imposed and thankless task, each year, of maintaining the standards of medical education. This duty now devolves on the people and on the educational authorities of the state. Governor Lowden and the state of Illinois are to be equally congratulated, the governor on the success of his efforts and the state on the securing of such progressive and constructive legislation.

THE AMMONIA OF THE GASTRIC JUICE

The statement that the gastric juice may contain ammonium salts is by no means of recent origin. It can be found in the classic monograph on the digestive secretions published by Bidder and Schmidt[1] in 1852. Subsequent observers have as a rule admitted the occurrence of ammonia in the secretion of the stomach, though most of them have not found it present invariably or under uniform conditions. The theories as to its origin are manifold; they include suggestions of the production of the ammonia by enzymatic deamination reactions taking place in the gastric mucosa, and likewise of the origin of this nitrogenous compound in the reactions leading to the elaboration of the acid gastric juice. As ammonia is a usual component of the urine, it may be looked on, therefore, as a form of excretory nitrogenous matter; and since it has become unquestioned that the gastro-intestinal tract may serve, like the kidneys, as a channel for the excretion of certain types of compounds, it is not farfetched to inquire whether or not the ammonia of the gastric juice may accordingly represent an attempt at an excretion of ammonia by way of the alimentary canal. The dependable facts in regard to the subject have been elaborated by the recent studies of Huber[2] at the Hull Physiological Laboratory of the University of Chicago. According to these, ammonia is normally found in small amounts in the gastric juice of man and

4. Lambert, R. A.: On the Question of the Transformation of Fibrin into Fibrous Tissue in Tissue Culture Preparations, Proc. Soc. Exper. Biol. and Med., 1916, 14, 5.

5. The Illinois Consolidation Bill Becomes a Law, Social Medicine, Medical Economics and Miscellany, THE JOURNAL A. M. A., this issue, p. 869.

1. Bidder and Schmidt: Die Verdauungssäfte und der Stoffwechsel, Mittau and Leipzig, 1852.

2. Huber, H. L.: Contributions to the Physiology of the Stomach, XL, the Ammonia of the Gastric Juice, Am. Jour. Physiol., 1917, 42, 404.

dog. The amount of ammonia in the pure gastric juice of man varies markedly in different individuals. It is increased by high protein diet, and by the addition of ammonium salts to the food. The fundal mucosa contains the most ammonia, the pyloric mucosa is next in order, while the mucosa of the cardiac end of the stomach contains the least ammonia. The duodenal mucosa contains less ammonia than the fundal mucosa. In certain pathologic conditions (especially gastric ulcer and cancer) the amount of ammonia in the gastric juice is definitely increased, but this increase may not be greater than that found persistently in certain normal individuals. These observations seem to indicate that the origin of the ammonia of the gastric juice is a complex one. This may be the case. When the concentration of ammonia in the blood is high it is evidently secreted to some extent through the stomach wall. However, the report of the isolation of a fairly constant bacterial flora from the pure gastric juice of man inevitably suggests the conclusion that enzymatic or bacterial action on the stomach mucosa or on the gastric juice may be responsible for some of the ammonia found in the gastric juice in some cases, even though the constancy of the ammonia content of the fresh juice of normal man and dog speaks against this as the sole or principal origin.

GAMBLING ON HUMAN FEAR

"At the Sign of the Dollar" is the title of an instructive and readable article on the psychology of advertising appearing in *Harper's Magazine* for March. It is written by L. F. Deland who, as he says, has devoted twenty years of his life trying to solve advertising problems. Obviously the author knows a good deal about advertising and knows it from the "inside." Of course he believes in advertising; in fact, he admits that he glories in it. In view of this it is interesting to see Mr. Deland's attitude toward the black sheep of the advertising world:

> "The patent-medicine man doesn't merely sell medicine; he gambles on the hopes and fears of mankind. Take this away and leave him only his medicine, and his profits would dwindle into insignificance."

This says in another way what THE JOURNAL has said before: There may be an economic, if not a moral, excuse for hypnotizing the public, through skilful advertising, into believing it wants more pianos, more hats, or more automobiles than it can really afford or has any legitimate use for. There is no excuse, either in economics or morality, for advertising which makes well men think they are sick and sick men think they are *very* sick, simply for the purpose of increasing the sales of drugs. This is not merely an economic fallacy, it is inhumanity.

Workman's Compensation Board.—According to Harry A. Mackay, chairman of the Pennsylvania Workman's Compensation Board, nearly four fifths of the men injured in the state industrial establishments during the last year have been cured within a period of two weeks after the accident. During the year ending Jan. 15, 1917, 2,587 men were killed in the course of their employment. Of the 255,722 persons injured, nearly 200,000 men have been so successfully treated by free medication that their injuries have not become compensatable.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DISTRICT OF COLUMBIA

Medical Education to Cost More.—To meet the increased cost of supplies and to permit an enlargement of educational facilities, tuition in the medical school of George Washington University has been increased from $150 to $175 a year, and in the dental school from $125 to $150, to take effect next fall.

Forgery to Obtain Narcotics.—A young married woman in Washington pleaded guilty, March 10, to an indictment for forgery in signing the name of a physician to prescriptions for a narcotic drug. The case was referred to the probation officer for investigation. It is alleged that for more than a year she kept her husband in ignorance of her drug addiction.

Revocation of License Sustained.—The Court of Appeals of the District has sustained the board of medical supervisors in its revocation of the license of Dr. Thomas J. Kemp to practice medicine in the District. The revocation was based on Dr. Kemp's conviction, March 24, 1913, of violating the postal laws by sending through the mails a letter concerning a proposed criminal operation.

ILLINOIS

Communicable Diseases.—Typhoid is reported to be epidemic in North Chicago, where twenty cases have been reported.

Dispensary Opened.—St. Mary's Hospital, East St. Louis, has opened a dispensary for the care of diseases of the eye, ear, nose and throat.

New Hospital for Rock Island.—A hospital to cost about $100,000 is to be built by St. Anthony's Hospital, Rock Island, on the grounds adjoining the present infirmary. The new building will accommodate 150 patients, will be of fireproof construction, of brick with stone trimmings, and will be in conformity with the old building.

Health Welfare Meeting.—A meeting of the Illinois Public Health and Welfare Association will be held in Springfield, April 12 and 13. The topics for discussion will include: infantile paralysis; state control of epidemics; registration and vital statistics; sanitary surveys; sanitary and welfare service; rural sanitation and hygiene; popularizing public health through the newspapers; city waste collection and disposal; water works and water purification; tuberculosis control; charities and health; laboratories as an adjunct in the control of communicable diseases; legal aspects of public health administration, and housing problems.

Chicago

Tuberculosis Instruction.—Arrangements have been completed between Northwestern University Medical School and the Chicago Fresh Air Hospital for a four weeks' course on tuberculosis for the senior class in the medical school. Dr. Ethan A. Gray, medical superintendent of the hospital, has been appointed assistant professor in the university.

Changes in Lecture Course.—The Chicago Tuberculosis Institute announces the following lectures for March:

March 22: "How the Visiting Nurse can Aid in the Discovery of Tuberculosis," and "Home Instruction by the Nurse," Miss Edna N. Foley.

March 29: "Studies in Tuberculosis Control," Dr. Clarence L. Wheaton. "Phthisophobia, an Earnest Plea for the Tuberculous Patient," Dr. John Ritter.

Surgical Operations in the Field.—The "close-up" views of surgical operations and hospital work in the field hospitals in and around Saloniki were given by Surg.-Col. Alexander Primrose, professor of surgery at the University of Toronto, at the eighth annual banquet of the University of Toronto Alumni Association of Chicago, March 2. Dr. Hugh A. Cuthbertson was elected secretary-treasurer of the association.

Personal.—Dr. John H. Long, dean of the school of pharmacy and professor of chemistry of Northwestern University, has been elected president of the Chicago Institute of Medicine.——Dr. Herman Berry celebrated his one hundredth birthday anniversary, March 10.——Dr. J. Gordon Wilson has returned after several months in military hospitals in England and France.——Dr. Frank Billings has been named as

head of the advisory committee of the Military Training Camps Association.——Drs. Harry M. Richter and Jacob R. Buchbinder have received Red Cross medals of the third class from the German government in recognition of their services at the Base Hospital, Naumberg.

IOWA

New Hospital Building.—The Atlantic Hospital moved from the old building into its new quarters, March 3, and the patients were transferred, March 5.

Psychopathic Hospital Bill.—A bill has been introduced in the house by Representative Klinker appropriating $150,000 for the establishment of a state psychopathic hospital, at Iowa City.

Typhus in Des Moines.—The Mexican laborer who was found in a bunk car in Des Moines, suffering from typhus fever, died, February 23. The bunk cars have been thoroughly fumigated.

State Medical Library Not Approved.—The Senate Appropriations Committee of the Thirty-Seventh Assembly voted that it report the indefinite postponement of the bill providing for a medical department for the state library.

MISSOURI

Personal.—Dr. John M. Bell, St. Joseph, captain in the Canadian Army Medical Corps, who has been for eighteen months overseas, has returned to St. Joseph on leave of absence.

Hospital Crowded.—On account of the crowded condition of the institution, which now has 1,800 patients, the hospital board of State Hospital Number 2, St. Joseph, has asked the state for a new building.

Health League Organized.—The Health Club of Kansas City, at a meeting held February 19, voted to change the name of the organization to the Health League of Greater Kansas City. A new constitution and by-laws were adopted and new officers were elected.

New Hospital Opened.—The new building of the St. Joseph Hospital, Kansas City, has been opened to receive patients. The formal dedication will occur March 24. The new building cost $750,000, is seven stories in height, of reenforced concrete, brick and terra cotta, and will accommodate 250 patients.

Honor Dr. Hall.—The dinner given in honor of Dr. C. Lester Hall, to commemorate the fiftieth anniversary of his entrance into practice, was given at the Hotel Baltimore, Kansas City, March 10, and was attended by nearly 200. A gold watch was presented to Dr. Hall, and addresses were made by Drs. Charles A. L. Reed, Cincinnati; Van Buren Knott, Sioux City, Iowa; J. Franklin Welch, Salisbury, Mo.; Boswell P. Anderson, Colorado Springs, Colo., and John H. Sevier, Brownsville, Tenn.

St. Louis

Reserve Corps Smoker.—The St. Louis Society of the Medical Reserve Corps, United States Army, gave a smoker at the St Louis Club, February 22, at which addresses were made by Col. Thomas U. Raymond, M. C., U. S. Army, and Major Henry F. Pipes, M. C., U. S. Army.

Personal.—Dr. Samuel B. Scholz, Jr., has been elected medical director of the Missouri State Life Insurance Company. ——Dr. G. William Poehl, recently appointed staff physician of the American Red Cross, for service in Vienna, has returned from Washington, his plans having been changed by international complications.

Public Health Association.—The various organizations interested in public health work are organizing the St. Louis Public Health Association, with the primary object of educating the people along the line of prevention of disease. The work was commenced by the St. Louis Tuberculosis Society, which has already mapped out a program and propaganda for the next ten years.

NEW YORK

Hearing on Health Insurance.—The Mills bill providing for compulsory health insurance in this state was the subject of a hearing before the Senate Judiciary Committee, March 7. The prevailing opinion is that the bill will be killed in committee.

Women Physicians to Meet.—The eleventh meeting of the Women's Medical Society of New York State will be held at the Hotel Utica, Utica, April 23. Scientific programs have been arranged for the morning and afternoon sessions, and the annual banquet will be held in the evening.

Health Officers Conference.—Health officers of all third-class cities of western New York will meet at Albany to discuss questions affecting the management of sanitary matters, budgets, communicable diseases, milk inspection and other subjects. The conference will be under the charge of Dr. Fred M. Meader, head of the division of communicable diseases.

New York City

Clinician Selected for New Prison.—Dr. Bernard Glueck, Washington, D. C., psychiatrist, who has been making a study of convicts in Sing Sing Prison, has been selected to conduct a clinic at the New Westchester County Penitentiary, East View.

Thayer in New York.—Dr. William S. Thayer of Johns Hopkins Hospital, Baltimore, delivered an address before the New York Academy of Medicine, March 15, on "The Significance of Some Common Deviations from the Ordinary in Cardiac Function."

Violator of Practice Law Sent to Workhouse.—Louis H. Warner, who has been conducting a "Serological Institute for Medical Research" in this city, is said to have been found guilty in the Court of Special Sessions of practicing medicine without a license. He has been sent to the workhouse for two months.

American Posture League.—A meeting of the American Posture League was held, March 10, at which the constructive work given to the public schools and industrial hygiene developed by the league were presented in a series of illustrated lectures. Miss Jessie H. Bancroft, president and founder of the league, presided.

High Death Rate from Pneumonia.—Since the middle of January there have been 622 more deaths from pneumonia in New York City than during the same period of last year. The number of deaths reported from influenza is relatively low, less than during the corresponding period of last year. The death rate of the city as a whole shows a decline for the first two months of 1917 as compared with that for the corresponding period of 1916, the rates being 16.83 as against 15.87.

Base Hospitals and Physicians Prepared.—Six base hospital units have been organized in New York City. These units are: Bellevue Hospital, Dr. George David Stewart, chief surgeon; Presbyterian Hospital, Dr. George E. Brewer, chief surgeon; Mount Sinai Hospital, Dr. Nathan E. Brill, chief surgeon; Post-Graduate Hospital, Dr. Samuel Lloyd, chief surgeon; German Hospital, Dr. Frederick Kammerer, chief surgeon, and the New York Hospital, Dr. Charles L. Gibson, chief surgeon.——At a meeting of the National Defense Committee, held at the Hotel Vanderbilt, March 9, at which Dr. Frank F. Simpson, Pittsburgh, presided, an auxiliary committee was appointed, with Dr. Charles H. Peck as chairman and Dr. Frederick E. Sondern as secretary.

OHIO

Senior Student Dies.—Henry F. Walters, a senior student at the Ohio State University, Columbus, and who had passed his examinations for internship at the Protestant Hospital, died in that institution, February 23, from Ludvig's angina.

Personal.—Dr. O. van der Stricht, professor of histology and embryology in the University of Ghent, Belgium, has been reappointed research fellow in cytology in the School of Medicine of Western Reserve University, Cleveland.——Dr. John J. R. McCloud, Massillon, professor of physiology in Western Reserve University, has been in Montreal on leave of absence, acting as professor of physiology in McGill University.——Dr. Howard T. Karsner, professor of pathology, has been elected secretary of the School of Medicine of Western Reserve University, Cleveland.——Dr. Russell J. Collins, demonstrator of pharmacology in Western Reserve University, Cleveland, has resigned because of ill health.——Dr. Stanley P. Reimann has been appointed Hanna Research Fellow in Pathology in Western Reserve University, Cleveland.——Dr. Samuel E. Ziegler, Cleveland, was operated on for hernia at the Grand Hospital, Columbus, February 27.——Dr. Thomas O. Whitacre, Bowling Green, while getting out of his automobile, was assaulted by John Gokey, who was arrested and sentenced to thirty days in the Toledo workhouse. ——Dr. Arl A. Baber has been reelected superintendent of the Dayton State Hospital.——The office of Dr. Herbert E. Noble, Toledo, was damaged by fire to the extent of $600, February 13.

Cincinnati

Personal.—Dr. Robert D. Maddox, Jr., has been appointed chairman of a board to examine officers for the Medical Officers Reserve Corps, U. S. Army, and has associated with him Drs. Goodrich B. Rhodes and Elmer A. Klein, Norwood. ——Dr. Arthur Pfeiffer sustained severe injuries in a collision between automobiles at Newport, recently.

Hospital Staff Appointments.—At the annual meeting of the board of managers of the Episcopal Hospital for Children the following appointments were made on the medical staff: Dr. George M. Allen, consulting physician; Dr. Frank H. Lamb, senior physician; Dr. James M. Bentley, junior physician; Drs. Clarence J. Broeman and James W. Miller, attending dermatologists; Dr. Robert Stevenson, assistant laryngologist, and Dr. Martin H. Urner, junior ophthalmologist.

OKLAHOMA

Personal.—Dr. Matthew Karasek, Drumright, suffered painful injuries recently by the overturning of his automobile. ——Dr. Harvey E. Rappolee, Caddo, was thrown from his buggy in a runaway recently, fracturing his arm.

New Medical License Bill.—The passage of a new medical license bill by the Oklahoma legislature recently was due in great measure to the efforts of the Oklahoma State Medical Association. The bill provides that all persons offering to cure diseases or holding themselves up to the public as doctors or physicians must pass the examination of the State Board of Medical Examiners. The passage of this bill will, it is believed, eliminate chiropractors from Oklahoma.

Convictions.—It is reported that Dr. William S. Clarke, Oklahoma City, was recently convicted in the United States Court, at Guthrie, February 8, of violation of the Harrison Narcotic Law and was given a jail sentence of sixty days.—— William Carver of the Carver Chiropractic College, who inserted an advertisement in an Oklahoma city paper recently, headed, 'Was the Senate Bought," is said to have been found guilty of contempt, March 3, was fined $500 and sentenced to imprisonment for ten days in the county jail.

OREGON

Legislative Appropriations.—The legislature appropriated $25,000 for the state board of health to carry on its work for the next biennium. This is $5,000 less than the last appropriation.——The Oregon Social Hygiene Society was given an appropriation of $20,000, and $100,000 was appropriated for the University of Oregon, Medical School.

Health Service for University Students.—The health service of the Oregon Agricultural College, Corvallis, which was organized last fall, has completed its first semester of work and has moved into a separate building. During the first semester, 3,239 calls were made by the college physician, 830 physical examinations were made and twenty-nine operations were performed. This service is maintained by the college and is available to any student.

Sterilization Measure Passed.—The house of representatives, by a vote of 37 to 18, passed the bill providing for sterilization of the feebleminded, insane, epileptics, habitual criminals, degenerates and perverts. The house bill provides for a board of eugenics composed of the state board of health and the superintendents of the Oregon and East Oregon State hospitals, the feebleminded institute and the penitentiary. This board will have the power to hold investigations and to order sterilization. The senate bill leaves the question to the board of alienists in the county court, and the patient may take an appeal to the circuit court.

Osteopathic Bill Passed.—House Bill No. 311, which entitles osteopaths to practice minor surgery, administer anesthetics and dispense narcotics, was passed by the house and senate, and received the endorsement of the governor. While the profession of Oregon endeavored to defeat the bill, the governor, in the following telegram to the secretary of the state board of health, apparently endeavors to excuse himself for signing it:

SALEM, ORE., Feb. 21, 1917.

Replying to your telegram and others received from Portland physicians, I regret to state that house bill, Number 311, has been signed as no protest whatever was made.

JAMES WITHYCOMBE, Governor.

State Board Items.—Drs. Charles T. Bacon, LaGrande, Harry E. Clay, Salem, and Robert J. Marsh, Portland, have been appointed members of the state board of health, succeeding Drs. Willis B. Morse, Salem, Edward A. Pierce, Portland, and Elijah B. Pickel, Medford, who have been members of the board since its inauguration, thirteen years ago. At the reorganization meeting of the board, February 21, Dr. Alvane C. Seely, Roseburg, was elected president; Dr. Marius B. Marcellus, Portland, vice president, and Dr. David N. Roberg was continued as secretary.——Dr. Frank W. Wood, Portland, has succeeded Dr. Luther H. Hamilton, Portland, as a member of the State Board of Medical Examiners.

Personal.—Dr. Walter Anderson has resigned as house surgeon of St. Vincent's Hospital, Portland, and has started for France, where he will take charge of the Red Cross Hospital, established by subscription from Oregon.——Dr. J. Christopher O'Day has resigned the chair of anatomy at the Northern Pacific College and his affiliations with the Medical Department of the University of Oregon. Dr. O'Day and family sailed from Vancouver, B. C., for Honolulu, March 14. A banquet was tendered to Dr. O'Day, March 7, by the City and County Medical Society, at which Dr. Alpha E. Rockey officiated as toastmaster.——Dr. James L. Manion, Portland, has been ordered to report to the United States Naval Hospital, Washington, D. C., for duty.——Dr. Edward P. Geary, former county physician of Multnomah County, was the guest of honor at a banquet, February 20, given by his former associates on the staff of the Multnomah County Hospital. ——Dr. Earl M. Rice, Portland, was surgeon of the British liner *Mantola*, which was sunk by a torpedo, February 10. He and all the passengers were saved.

PENNSYLVANIA

Personal.—Lieuts. Henry B. Davis, Lancaster; J. Stratton Carpenter, Jr., Pottsville, and George R. Winters, Pittsburgh, have resigned from the Medical Corps, N. G. Pa.——The commission of Major George F. Potteiger, M. C., N. G. Pa., Hamburg, expired, February 4.——Lieut. Charles Francis Linn, M. C., Monongahela, has been transferred from the supernumerary list and assigned to duty with the Tenth Infantry.——Dr. Luba Rolin Goldsmith, Pittsburgh, has been elected secretary of the Milk Commission of the Allegheny County Medical Society.

Philadelphia

Visitors at College of Physicians.—At the meeting of the College of Physicians of Philadelphia, March 7, Dr. Rufus I. Cole of the Rockefeller Institute read a paper on "The Serum Treatment of Pneumonia." illustrated by lantern slides, and Dr. Samuel Robinson, Rochester, Minn., delivered an illustrated address on "The Surgical Aspects of Pneumonia and the Intrathoracic Complications of that Disease."

Medical Auxiliary for Defense Work.—The Philadelphia Medical Auxiliary of the Council of National Defense was organized at the Bellevue-Stratford, March 6. The committee is as follows: Dr. John H. Jopson, chairman; Dr. Charles A. E. Codman, secretary, and Drs. Richard H. Harte, Edward Martin, Robert G. LeConte, John M. Baldy, John B. McAllister, Harrisburg; George E. deSchweinitz, Ross V. Patterson, Frank C. Hammond, John H. Gibbon, Elijah H. Siter, Edward Kirk, Cyrus L. Stevens, Athens, William Pepper, Seneca Egbert and Lieut.-Col. Henry F. Page, M. C., U. S. Army. To these will be added an officer of the Medical Department of the National Guard of Pennsylvania.

Personal.—Dr. Harvey M. Righter has been commissioned lieutenant and passed assistant surgeon in the State Naval Militia.——Dr. William M. Sylvis has been commissioned first lieutenant, M. C., N. G. Pa.——The resignations of Lieuts. William W. Van Dolsen and Charles B. Kendall, M. C., have been accepted.——Major Frederick O. Waage, M. C., has been relieved from duty with the First Infantry and assigned to duty at headquarters division.——Dr. Hobart A. Hare, who has been seriously ill, has recovered and resumed his college work and practice.——Dr. Paul J. Pontius has been appointed visiting ophthalmologist to the Philadelphia General Hospital. ——Dr. Charles P. Emerson, Indianapolis, spoke on "Social Service from the Medical Point of View" at the County Medical Society, March 14.——Dr. Simon Wendkos has been appointed medical director of the Lebanon Hospital.——Dr. Frederick P. Henry has resigned as professor of the practice of medicine in the Woman's Medical College of Pennsylvania, Philadelphia, to take effect at the close of the present term.

CANADA

Ontario Board of Health.—The Department of Militia and Defense, Ottawa, has advised the Ontario Board of Health that for the twelve months ending Dec. 31, 1916, only 167 cases of typhoid fever were reported in the Canadian expeditionary force in Canada. Typhoid vaccine amounting to about 600,000 doses for about 450,000 men has been supplied by the Ontario Board of Health.

Hospital Notes.—The hospitals of the Province of Ontario have asked the Ontario government that the grant of 20 cents a day be raised to 40 cents, and that hospitals be allowed to collect from municipalities $1.50 a day for indigent patients instead of $1, as at present.——The chancellor of Queen's University, Kingston, Ont., Dr. John Douglas, New York, has agreed to give $100,000 toward a fund to develop Kingston General Hospital into a capacious modern institution, with a view to improving its teaching facilities in connection with the medical department of Queen's University.

Personal.—Word comes from London, England, that Col. Lorne Drum, Ottawa, has been appointed assistant medical director of the fifth division; Major C. Charles A. Young, deputy director; Col. James W. Bridges, assistant medical director at Bramshott, and Capt. Alexander E. Garrow, acting staff captain, fifteenth brigade.——Col. Herbert A. Bruce, Toronto, has returned to France as an official of the Imperial War Office.——Col. Adam T. Shillington, Ottawa, has become commandant at the Kitchener War Hospital, Brighton, England.——Dr. Newton Albert Powell, Toronto, has been elected president of the Aesculapian Club; Dr. Harry B. Anderson, vice president; Dr. George A. Elliott, secretary; Dr. Edmund E. King, treasurer, and Drs. Frederick A. Cleland, Richard A. Reeve, George A. Bingham and Lieut.-Col. Irving H. Cameron, all of Toronto, executive committee. The latter will soon return to England for hospital duty.

Military Affairs.—Medical officers of the Canadian overseas forces in the future will be appointed with lieutenant's rank, and will draw the pay allowance and pension of a captain. Candidates having graduated one year or over will be appointed to the rank of captain. Lieutenants will be promoted after one year's service.——Every man of the forty members who have enlisted for overseas service of the University of Toronto Masonic Lodge, which has existed only since 1910, is an officer. The list includes three colonels, three lieutenant-colonels, six majors, fourteen captains and fourteen lieutenants. Among the number are several prominent practitioners of medicine in Toronto.——The militia authorities of Ottawa are in communication with the Canadian High Commissioner, Sir George Perley, in regard to securing a competent medical officer to become director of invalids from overseas. The names of Col. John T. Fotheringham, C. M. G., Toronto; Col. Murray Maclaren, C. M. G., St. John, N. B., and a Colonel Ford are mentioned for this position.——The Toronto School Medical Inspection bill before the Ontario legislature has been given its second reading, and will now be sent to the municipal committee for consideration. The bill provides for the transfer of medical inspection from the board of education to the city department of public health.

GENERAL

Personal.—Dr. and Mrs. Philip Ford Prioleau, U. S. Navy, sailed for the Asiatic station from San Francisco on the transport *Sheridan*, March 5.

Grayson Again Nominated as Medical Director.—The president has again sent to the Senate the nomination of Dr. Cary T. Grayson as medical director in the navy. Dr. Grayson's first nomination, to the Congress that has just adjourned, failed because a number of senators believed that his proposed promotion over so many seniors in rank was not in the interest of the naval service.

Dinner to Major Gilchrist.—Major Harry L. Gilchrist, M. C., U. S. Army, chief surgeon of the Eleventh Division, was given a farewell banquet by the officers of the division at the Hotel Sheldon, El Paso, March 5. Major Harry H. Snively, Columbus, commanding Ohio Field Hospital, No. 2, was toastmaster. A pair of field glasses was presented to Major Gilchrist on behalf of the officers by Lieut.-Col. Alexander N. Stark, M. C., U. S. Army.

More Medical Aid Needed.—Dr. Richard H. Harte, president of the Pennsylvania Chapter of the American Red Cross, spoke before the Pennsylvania Women's Division for National Preparedness of the Red Cross on "The Woful Unpreparedness of the Country." He states that England has already 30,000 beds in Boulogne and more than 200,000 beds in England, and that this country at present has twenty base hospitals of 500 beds each, or 10,000 beds.

American Life Convention Meeting.—The Medical Section of the American Life Convention held its annual meeting at Excelsior Springs, Mo., March 7 to 9, under the chairmanship of Dr. Frank P. Foxworthy, Indianapolis. The following officers were elected: chairman, Dr. Joseph P. Turner, Greensboro, N. C.; vice chairman, Dr. Green V. Wollen, Indianapolis; secretary, Dr. Frank L. B. Jenney, Chicago (reelected), and member of the board of managers, Dr. John H. Florence, Houston, Texas. Richmond, Va., was selected as the next place of meeting.

FOREIGN

The Fight Against Tuberculosis in France.—France is organizing to combat the spread of tuberculosis after the war among men weakened by hardships of the campaign. About 100,000 men in the army have already been attacked by tuberculosis, and of these about 80,000 have already been sent to their homes. A great chain of national sanatoriums is proposed to handle this problem. In 1915 a yearly credit was opened by the government which assures tuberculous soldiers of a certain amount of assistance during the war. There is also an arrangement which allows tuberculous soldiers three months in a civil sanatorium at the expense of the state.

Epidemic Diseases.—An outbreak of smallpox is reported in Berlin and its immediate vicinity, and compulsory vaccination has been ordered. Eighty cases of smallpox have already been reported, 90 per cent. of which are among persons over 45 years of age. The disease is believed to have been transmitted from Volhynia.——Smallpox is said to be raging in Canton, China, where forty-eight vaccination stations have been established, and compulsory vaccination is being enforced.——An epidemic of typhoid fever is said to be prevalent in Jerusalem, where only two physicians, one a woman, now remain to care for the 80,000 inhabitants of the city.

PARIS LETTER

PARIS, Feb. 15, 1917.

The War

THE CAMPAIGN AGAINST ALCOHOL

In spite of the prohibitive measures taken since the beginning of the war, alcohol continues to make its ravages. The authorities are now considering the absolute prohibition of the use of alcohol, as was done in Russia. Naturally, such action has aroused much feeling among the retailers of alcoholics. The committee of commerce, industry and agriculture, at one of its recent meetings, authorized an investigation of this matter. Members of the section on beverages, who were present at the meeting, complained against what they were pleased to term "the persecution of business." Besides the prohibition of the importation of alcohol and the levying of an extra tax on it, dealers are to be restricted to a stock of 100 hectoliters.

Possibly the government will issue an edict absolutely prohibiting the use of these beverages. The liquor dealers regard this as a disaster, not only for commerce, but also for the country. There are 30,000 wholesale liquor dealers in France, and 500,000 retailers. These men, together with their employees, a not inconsiderable number, would be practically without employment, as they would be forced to close their doors. On the other hand, the retailers claim that the use of alcohol for drinking purposes has diminished 50 per cent. since the beginning of the war. The consumption has fallen from 1,800,000 to 900,000 hectoliters. A strong protest was registered at this meeting against all measures tending to suppress the consumption of alcohol, on the ground that the laws now in existence, if properly administered, were sufficient to control the situation. The authorities, however, are of a different opinion. The Chamber of Deputies has enacted a law to repress intoxication, and to police all places in which liquors are sold. It is interesting that at the meeting referred to it was voted that alcoholism is a national peril, but that it also was one of the nation's most valuable assets. It was urged that the production of alcohol for commercial use be encouraged, but that the drinking of alcohol be restricted. Unfortunately, the dealers in alcoholics are not all in favor of this restriction. An anonymous communication presenting this point of view is being distributed widely. It appeals to the people for support to combat what is regarded as a catastrophe for France. It appeals particularly to the temperance advocates, calling their attention to the fact that the prohibition of the use of alcohol would include cognac, rum, curaçao, black-currant ratafia, Madeira wines, quinin and gentian tonics, etc., thus bringing inevitable ruin on France and her colonies, leading to popular uprisings, and last, but not least, the triumph of German beer.

THE NEW BREAD

M. Herriot, head of the commissary department, presented to the Chamber of Deputies rules for regulating the manu-

facture of a new bread. According to these rules bread may be made with white flour (15 per cent.) mixed with rye, maize, buckwheat and beans. Millers must not sell any flour other than this mixture, nor will the bakers be permitted to sell any other bread than this.

PHYSIOLOGIC NUTRITION

M. Gley, a professor in the College of France, recently discussed the elements of nutrition, especially as they apply to the young and to soldiers. Meat, in moderate proportions, he regards as indispensable to the human organism, because it contains the needed albumin; but unless meat contains tryptophan and lysin, it is worthless as a food. Dried fruits, being rich in cellulose, may be substituted for green vegetables, and therefore would be suitable for inclusion in the rations of the soldiers.

THE SUGAR RATION AND THE USE OF SUBSTITUTES

All the departments of France, except Corsica, have accepted the sugar card, to become effective February 15. On or before March 1, the general adoption of this card becomes obligatory. Prefects will be allowed an additional quantity of sugar to be used for the sick, young children and French prisoners of war in Germany. Saccharin must be used by various industries. The minister of foods, M. Herriot, has proposed the authorization of the use of saccharin or any other artificial sweeting substance in the preparation or manufacture of foods and beverages.

The Moving Picture in the Campaign Against the Fly

The French Sanitary League proposes to make use of the moving picture in the campaign against the fly. Special films have been prepared for that purpose. They will be shown for eight days in each of the 4,000 moving picture theaters of France. These films shows the birth and growth of the fly, its habits and haunts, its familiarity with man, and how diseases are conveyed by it. The mosquito also comes in for its share of attention. The mosquito film will be shown principally in southern France. It covers the same ground as do the fly films. The people are also instructed in the methods of prevention of mosquito propagation.

LONDON LETTER

London, Feb. 19, 1917.

The Health of the Navy

At a meeting of the Medical Society of London, Surg.-Gen. H. D. Rolleston described the organization, equipment and methods in operation to deal with the naval wounded and the sick. In modern naval engagements the hospital ships, for obvious reasons, are unable to accompany the fleet and take charge of the wounded. To meet the need it had been suggested that fast 500-ton boats, registered under the Geneva Convention, and having appliances for rapidly rescuing survivors from the sea, should be employed. This, however, has not yet been done. The general health of the grand fleet has been extremely good. In 1913 the average daily percentage of sick in the whole fleet was 2.37, and in 1914, 2.03. The daily average has always been under 1 per cent. Except in the Mediterranean fleet there have been few cases of typhoid fever; in that fleet, however, during the latter part of 1915, the crews of most of the ships were attacked by gastro-enteritis, the infection having been spread by flies, and by men returning from the beach to their ships. The good bill of health shown by the fleet as a whole is a tribute to preventive medicine. Factors in this result are the comparative isolation of the fleets, especially of the grand fleet, rendering the chances of venereal infection and alcoholic excess practically nonexistent, especially in view of the careful quarantine arrangements, supplemented as these measures are by lectures on hygiene to the men, and the provision of healthy forms of recreation. Compared with land battles, a striking number of the men hit in naval engagements are killed outright. This was true also in the Russo-Japanese War. The wounds, however, owing to the absence of soil contamination, are much cleaner. Burns form at least one third of the casualties, and may be due to the ignition of our own cordite, to burning furniture, or to the momentary flash of high explosive shells in a confined space. Shock is found to be excessive in proportion to the amount of tissue damage. For this reason immediate operation is much less frequent than after land battles. In the gas poisoning resulting from explosives, the most hopeful measures are prophylactic; treatment of the established condition is not very hopeful. There was a striking freedom from cholera among the men of the Royal Naval Division, though they were operating in a locality in which the Turks suffered considerably from it. This immunity is attributable to the anticholera inoculations which had been carried out. Among airmen, leakage of the gasoline spray has caused some to become dizzy, while headache and drowsiness may be produced by exhaust gases from the engine. One airman, who had been exposed to low temperatures at a height of 15,000 feet, suffered from frost-bite.

Boric Acid in Cream

Numerous representations were made to the Local Government Board before the war on the subject of boric acid in cream. Some urged that the use of all preservatives should be prohibited, while others maintained that it would be impracticable to carry on the present trade in jugged cream unless some small amount of preservative was added. The department was asked to lay down a maximum limit, and had decided to appoint a small committee, but owing to the war this intention was not fulfilled. The president has now issued an order directing that no more than 0.4 per cent. of boric acid shall be added to cream, and that cream to which boric acid has been added shall be sold as "preserved cream," and prescribing forms of labels to be affixed to the receptacle containing such cream, stating that it contains boric acid and is unsuitable for infants and invalids. The board desires it to be understood that in temporarily forbidding a greater addition percentage of boric acid than 0.4 it must not be regarded as deciding the question proposed for inquiry as to whether or not this amount is injurious to the consumer. The inquiry, when it takes place, may show that the limit should be lower, and dealers are asked to reduce it to the smallest possible amount, or to dispense with it entirely, so that they may find less difficulty in complying with any further restrictions which may be made on the recommendations of the committee when appointed.

Speech Without Use of the Larynx

In the *Journal of Physiology*, Dr. E. W. Scripture has recorded a remarkable case of speech without use of the larynx. The patient was a girl, aged 17, who had undergone tracheotomy at the age of 3. Ever since, she had breathed through a tracheotomy tube and had been unable to breathe when the tube was stopped or removed. Observation with the laryngoscope showed that the top of the pharynx was closed over the larynx and no air passed through. On retching, the larynx was brought up and became visible. Under no circumstances could she make any air pass through the larynx. She could speak distinctly and correctly in a faint, almost toneless voice. Such a condition seemed astonishing, because all speech sounds require breath. Without breath the person may go through all the movements of enunciation, but he will produce no sound; his speech is visible, but not audible. Careful observation revealed the mechanism. A movement of the muscles at the side and front of her neck, just under the jaw, could be seen from the outside; the movement was of a kind that might contract the pharynx. With the mouth open the tongue could be seen to be raised tightly against the rear edge of the palate and the front part of the velum. There was some slight movement on attempting to change the pitch. The mechanism was evident. The air in the pharynx was compressed; it was allowed to escape between the tongue and the velum in such a way as to produce a tone. The tone was produced by causing the surfaces of the tongue and the palate to vibrate somewhat as the vocal cords do. The change in pitch was produced by changes in the tension. In short, the lacking glottis was replaced by an imitation glottis formed by the tongue and the velum. The different vowels were produced by varying the mouth cavity.

BERLIN LETTER

(*Received, March 2, 1917*)

Berlin, Dec. 20, 1917.

Morbidity Statistics and the War

Owing to the food restrictions, additions to the diet of the sick can be obtained only on physicians' orders, and as these orders must state the nature of the illness, they can be made to serve as bases for a statistical study of the morbidity of certain districts, thus furnishing information which could not be obtained in any other way. That is particularly true of diabetes. In Charlottenburg, 706 requests for food additions were made because of diabetes. There were five cases of conjugal diabetes. In one instance a father and son had diabetes. Fifty-seven per cent. of the cases occurred in males, 43 per

cent. in females. The same mortality percentage was noted (Berlin statistics for the five-year period 1905-1910 show 61 per cent. males and 39 per cent. females). The percentage for each thousand population for Charlottenburg (309,000) was 2.3. A survey of the occupation of these patients shows that most of them were merchants; next in order were public officials, academicians and pensioners. The majority of the patients were between 60 and 70 years of age. The death rate was no greater during the war than previously. During the first six months of 1916 the male mortality was lower than it had been at any time during the previous five years; the mortality of the women was about the average. Therefore, the necessary food restrictions have not had any influence on the mortality rate of diabetes.

The influence of the war on the incidence of diabetes has also been studied. Professor Umber found only eleven cases of diabetes among 2,232 soldiers. Von Noorden is of the opinion that the majority of cases of diabetes among soldiers occurred in persons who, previous to their enlistment, were what is termed "hidden diabetics," and therefore military service did not cause the disease, but merely hastened its appearance. Von Noorden's experiences during the war have also strengthened his belief that, excluding certain exceptional instances, diabetes will not develop in any one who was not "born to have the disease." The exceptions are those persons who, for various reasons, have fallen a prey to a disease of the previously healthy pancreas; for instance, arteriosclerosis, trauma, calculus formation, and infections and toxic agents. He does not believe that a persistent and progressive cause of diabetes ever develops because of some condition in the central or sympathetic nervous system. From such a source a transitory hypersuprarenalism may occur, and be accompanied by a temporary increase in the sugar elimination with the appearance of diabetic complications. These factors are more often encountered among the combatants. A soldier who, previous to his enlistment, had a well developed case of diabetes, usually succumbs quickly to the insufficient nourishment and strain of military service. Most of these men were officers in active service who were unwilling to retire. In the milder cases of diabetes the glycosuria is increased in severity during service, but yields quickly to proper treatment at home.

The German Central Book Station for the Blind in Leipzig

This station was opened, December 16. Many books have been provided, enough to supply the demand for twenty years. Every field of study is represented—philosophy, pedagogy, history, geography, law, political economy and civics, art, history of art, literature, biography, medicine, reference works, history of literature, war literature, music and the study of music. There is also a large reading room containing periodicals of all kinds. A special room is provided for music literature and a completely equipped print shop, as well as a large store room.

War Death Rate

In 1911 the death rate per thousand population was 16.3; in 1912, it was 14.6; in 1913, 14.0; in 1914, 16.1; in 1915, 19.7, and during the first six months of 1916 (computed by the year), 17.0. The increase occurred only in cities of 15,000 population and over, including all persons in the military service, especially the wounded. The increase in the mortality for 1916 was only 0.7 per cent. greater than in 1911, certainly not a remarkable increase. The infant mortality during the first year of life was: 1911, 29.7 per cent.; 1912, 24.6 per cent.; 1913, 24.8 per cent.; 1914, 22.7 per cent.; 1915, 13.4 per cent.; 1916 (first half of the year), 11.5 per cent. In other words, a continuous and steady reduction, even during the period of food restriction.

Duration of Prophylactic Smallpox Vaccination

Observation has shown that a single vaccination does not confer permanent immunity from smallpox, and that the second vaccination (made eleven years after the first) conferred permanent immunity. Further, the belief is confirmed that one vaccination confers an immunity of about ten years' duration. The reaction of the tissues against the vaccination itself may be taken as an indication of the activity of the antibodies present in the tissue cells. This applies not to the first, but to subsequent vaccinations. A perfect "take" indicates absence or great attenuation of the antibodies. An imperfect "take" indicates the presence of antibodies in a degree corresponding to the "take." The relationship of age to the protection given by vaccination was studied by Dr. H. A. Gins, one of the associates at the Institute for Infectious Diseases in Berlin. The first immunity had ceased in one fourth of those vaccinated for the second time at the age of 12, whereas the immunity following the second vaccination did not begin to show any sign of waning until the age of 30. After 40 the immunity began to wane in about one third of the vaccinated. It would seem, therefore, that a revaccination at 40 is desirable, as it would prevent the occurrence of smallpox for the remainder of the person's life.

BUDAPEST LETTER

BUDAPEST, Nov. 30, 1916.

The Death of Emperor Francis Joseph

Francis Joseph died, Nov. 21, 1916, at the age of 86, after a reign of forty-seven years. His last illness was of relatively short duration. It began early in November with a slight cold and a cough. His general health was so good that he was able to attend to his duties as usual, although unable to go outdoors. November 15, his condition became worse, his temperature rose to 38.2 C. (100.9 F.) at 4 p. m., and he suffered from fatigue, weakness and a loss of appetite. On the 16th the temperature increased and he became weaker. The attending physicians, Dr. Kerzl, surgeon-general and major, and Dr. Ortner, professor of medicine at the University of Vienna, diagnosed the case as a slight bronchitis. In spite of his illness, the emperor was up and about as late as November 18, giving audiences daily. On the morning of the 19th his condition became serious. Dr. Kerzl and Professor Ortner discovered a pneumonic focus in the right lung, and prescribed quinin and a digitalis preparation. Toward evening the inflammation in the lung decreased slightly; however, the emperor gradually lost strength, although his appetite had improved and he had enjoyed his dinner and drank champagne. Tuesday morning, the fever had risen to 39 C. (102.2 F.), remaining at that height all day despite the administration of antipyretics. At noon he had no appetite, the heart action was feeble, the pulse rate was 108, and the inflammatory focus in the lung was unchanged. During the afternoon the heart gradually became weaker, and subcutaneous injections of camphor were ineffective; at dawn the patient had become stuporous. During the day he was slightly delirious. His last words were, "I am tired."

The body of the emperor was embalmed at Schönbrunn (near Vienna). In accordance with ancient custom, the heart was placed in a silver vessel and the internal organs in a copper jar, and the body together with the silver vessel and the jar were carried into the Hofburg, the royal castle. The interment of the body took place, November 30, amid great pomp.

The medical profession of Austria-Hungary owes a debt of gratitude to the late emperor, who made possible great progress of medical science and marked achievements of the profession. If we compare the condition of the profession at the time of his accession to the Hungarian throne in 1867, when the entire faculty of medicine of the university was located in one building, to its present condition, in which our clinics are universally admired, we cannot forget that the late emperor so led his government that it was able to devote millions of dollars to the development of the universities.

Francis Joseph understood that it was not to the advantage of the medical sciences to be centralized, and he therefore caused the erection of a second university in Kolozsvar (Klausenburg) in 1888, which bore his name, the Francis Joseph Scientific University. Since that time two other universities have been erected, one in Pozsony (Pressburg) and one in Debreczen, both opened during the present war. In 1874, the emperor sanctioned new laws which were the foundation of the new public hygiene and sanitary sciences. These were of great assistance in checking the ravages of the many epidemics which prevailed in the country. It is due to the strict adherence to these laws that no epidemic of contagious diseases developed even during the present war.

Francis Joseph felt great sympathy for suffering, as evidenced by his frequent visits to the hospitals. It gave him pleasure to utter a few consoling words to the patients in the wards, and he continually made liberal donations to the universities and hospitals from his private fortune. During his reign the position of the parish and village doctors was much improved, as they were made state officials with a pension on retirement.

It is an indisputable fact that he took greater interest in medicine than in any other science. During his rule there lived the greatest men of the Vienna school: Schuh and

Skoda, Hyrtl and Rokitansky, the congenial Billroth and the brilliant pedagogue Albert, the universal genius von Brücke, the artistic Meynert, Arls and Jaeger, von Hebra and Kaposi, and the representatives of the modern clinic, Bamberger and Nothnagel.

THE EMPEROR'S PHYSICIAN

For several decades Dr. Josef Kerzl was the guardian of the emperor's health. He knew his patient's nature better than his own, and almost lived the emperor's life over again as he observed his every step and accompanied him wherever he went. Thus they grew old together. Dr. Kerzl was an eminent physician and the foremost scholar of the Vienna school of 1870. He is one of the most modest men in the empire, although as the intimate friend of the emperor he might have acquired great influence. He was the only person, with the exception of the grandchildren of the emperor, who was allowed to enter the emperor's room after simply knocking at the door. During the war Dr. Kerzl was promoted to the rank of "General-Stabsarzt," his title being "His Excellency."

The Diet of Tuberculous Patients, with Special Regard to War Conditions

Dr. Schröder recently delivered an address on this subject before the Vienna Antituberculosis League. He said that the preservation of albumin by tuberculous patients is of the utmost importance. Emaciated patients require a much greater amount of fat and albumin than is required by an ordinary person. For normally nourished tuberculous patients the same rules apply as for working people. The aim of therapy is not the increasing of fat, but the strengthening of the musculature and flesh by exercise. The most important nourishment for tuberculous patients at present is fat. Instead of the 80 gm. of fat required daily, there are only 60 gm. a day at disposal in Germany. The substitution of carbohydrates for fats, though possible in healthy subjects, is impossible in the case of tuberculous patients, as it places too great a strain on the intestinal canal. Moreover, fat has a specific effect in tuberculosis. At least 1 liter of milk is to be given daily, goat's milk to be used if possible, as this is rich in fats. One hundred gm. of animal fat should also be consumed daily in the form of grease, bacon or butter. Cheese, containing much fat, is to be used for dessert. Nuts and cod liver oil are also efficacious, and the soya bean is rich in fat. One part of fat may be replaced by such carbohydrates as do not irritate the intestinal canal, as fruit jelly, dried fruits, honey, light farina puddings and leguminous vegetables. The amount of meat consumed may be restricted, although it may not be entirely dispensed with. Fish is a valuable food. Gelatin is a good means for sparing albumin. Soups made from fruit jellies, as well as meat broths, are to be highly recommended, as is also the utilization of the blood of slaughtered animals.

Association News

THE NEW YORK SESSION

Advisory Committee on Scientific Exhibit

In order to stimulate interest in the Scientific Exhibit, to secure suitable material for it and to counsel on scientific matters, an Advisory Committee on Scientific Exhibit has been appointed consisting of Dr. Harlow Brooks, New York; Dr. A. S. Warthin, Ann Arbor, Mich.; Dr. H. C. Moffitt, San Francisco; Dr. Geo. Dock, St. Louis; Dr. C. C. Bass, New Orleans; Dr. Walter B. Cannon, Boston; Dr. Ludvig Hektoen, Chicago; Dr. L. B. Wilson, Rochester, Minn.; Dr. W. M. L. Coplin, Philadelphia; Dr. James T. Case, Battle Creek, Mich., and Dr. Joseph C. Bloodgood, Baltimore. The Scientific Exhibit at the New York Session will occupy the Belvedere on the ninth floor of the Hotel Astor. The amount of space available is limited and will be assigned to the individuals or institutions presenting the best scientific material. Applications should be made as early as possible. Assignment of space will be made Monday, April 2, and all applications must be received before that time. Application blanks and further details can be secured by addressing the Director of Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

Marriages

Lieut. Louis Anatole LaGarde, Jr., M. R. C., U. S. Army, to Miss Alice Eugenia Hale, both of Washington, D. C., February 26.

Herbert C. Kimberlin, M.D., Trenton, Mo., to Miss Beulah Beatrice Campbell of Gaucett, Mo., at Kansas City, Mo., February 28.

James Collier McConaughey, M.D., Cameron, W. Va., to Miss Edna Margareta O'Neill of Wayne, Pa., in Philadelphia, February 28.

Lieut. Arvid E. Anderson, M. R. C., U. S. Army, Hoquiam, Wash., to Miss Lois Mae Williams of Punxsutawney, Pa., January 1.

Charles Hamlin Pelton, M.D., St. Paul, to Miss Elizabeth S. Sullivan of Mount Clemens, Mich., at St. Paul, February 26.

Asst. Surg. Philip Ford Prioleau, U. S. Navy, to Miss Ruth Vincent Bridgman, at Baltimore, February 24.

William B. Foster, M.D., Woodbine, Kan., to Mrs. Elizabeth Simpson of Lansing, Kan., February 21.

Henry A. Dedman, M.D., Canby, Ore., to Miss Blanche Jobe of Philadelphia, at Seattle, January 27.

Clarence Kenneth Jones, M.D., Indianapolis, to Miss Louise Wille of Chicago, February 26.

James B. Wright, M.D., to Mrs. Emma Wynne Gillilan, both of Trenton, Mo., March 1.

John M. Thomas, M.D., to Miss Pauline Paul, both of Columbus, Ohio, February 28.

Frank Fulton Maple, M.D., to Miss Edith Marian Russell, both of Chicago, March 3.

Deaths

John Little Moffat, M.D., Ithaca, N. Y.; New York Homeopathic Medical College, 1877; aged 63; a member of the American Ophthalmological, Otological and Laryngological Society; for several years consulting ophthalmologist to the Cumberland Street Hospital, Brooklyn; editor of the *Journal of Ophthalmology, Otology and Laryngology* from 1901 to 1904, and of the *Homeopathic Eye, Ear and Throat Journal* from 1905 to 1910; died at his home, February 18, from tuberculosis.

Alfred Owen Hitchcock, M.D., Fitchburg, Mass.; Harvard Medical School, 1870; aged 74; formerly a member of the Massachusetts Medical Society; chairman of the board of health and city physician of Fitchburg; surgeon of the Fifty-Third and Fifty-Seventh Massachusetts Infantry during the Civil War, and brevetted major on the staff of Gen. Nelson A. Miles; died at his home, January 20, from bronchopneumonia.

Joseph Emil Huber, M.D., Peoria, Ill.; Northwestern University Medical School, Chicago, 1910; aged 49; a Fellow of the American Medical Association; a specialist in internal medicine; a member of the medical staff of Proctor Hospital and once president of the Illinois State Pharmaceutical Association; died in the Proctor Hospital, Peoria, February 27, from septicemia three days after an operation for cholelithiasis.

Reuben Howard Osborn, M.D., Detroit; Western Reserve University, Cleveland, 1849; aged 93; formerly chief of the medical staff of the Calumet and Hecla Mining Company, Calumet, Mich.; for several years a member of the school board of Calumet, and state senator in 1877 and 1878; a pioneer practitioner of the copper country; died at his home, February 21, from cerebral hemorrhage.

William T. O'Reilly, M.D., New Orleans; Tulane University, New Orleans, 1884; aged 55; formerly a Fellow of the American Medical Association; a member of the Louisiana State Medical Association; president of the New Orleans City Board of Health since 1906; an active, aggressive and efficient health officer; died at his home, March 9, after an illness of three months.

James Greenup Boyd, M.D., Houston, Texas; Bellevue Hospital Medical College, 1889; aged 54; a Fellow of the American Medical Association; first lieutenant and assistant surgeon of the First United States Volunteer Infantry, during

the war with Spain; chief surgeon of the Houston Hospital and Sanitarium; died at his home, February 27, from pneumonia.

Elmer Ellsworth Patton, M.D., New Kensington, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1889; aged 55; a Fellow of the American Medical Association; formerly surgeon of the American Bridge Company and later president of the New Kensington (Pa.) Bridge Company; died at his home, March 2, from pneumonia.

George G. Burns, M.D., Fremont, Mich.; Detroit College of Medicine and Surgery, 1904; aged 40; a Fellow of the American Medical Association, and formerly secretary of the Newaygo County Medical Society; died in the Blodgett Memorial Hospital, Grand Rapids, Mich., from myocarditis, following tonsillectomy, February 23.

John Hopkinson Healy, M.D., San Francisco; Cooper Medical College, San Francisco, 1881; aged 63; at one time superintendent of the San Francisco City and County Hospital, and professor of surgery in the College of Physicians and Surgeons of San Francisco; died at his home, February 18, from hemorrhage of the lungs.

Henry Ruhl, M.D., New York; Bellevue Hospital Medical College, 1873; aged 70; a Fellow of the American Medical Association; formerly visiting physician to Fordham Hospital and physician to the Twenty-Third and Twenty-Fourth Ward dispensaries; died at his home, February 25.

Gustav Theodore Fox, M.D., Bethlehem, Pa.; New York University, New York, 1865; Bellevue Hospital Medical College, 1875; aged 73; a Fellow of the American Medical Association; a specialist in ophthalmology; died in Bethlehem, February 27, from angina pectoris.

Thomas B. Phinizy, M.D., Augusta, Ga.; Medical College of Georgia, Augusta, 1847; aged 91; for many years a member of the board of trustees in his alma mater; one of the oldest and most prominent citizens of Augusta; died at his home, February 16.

Martin Taylor Billingslea, M.D., Altoona, Kan.; Dearborn Medical College, Chicago, 1906; College of Physicians and Surgeons, Chicago, 1908; aged 44; a Fellow of the American Medical Association; died in his apartments, February 26, from heart disease.

Angus H. L. Smith, M.D., New York; Jefferson Medical College, 1915; aged 27; an intern in the New York State Hospital, Blackwell's Island; died in the New York Eye and Ear Infirmary, January 18, from meningitis following a mastoid operation.

Elmer Newcomer, M.D., Baltimore; University of Maryland, Baltimore, 1913; aged 27; a Fellow of the American Medical Association, and superintendent of the Maryland General Hospital; died, March 11, from septicemia due to an autopsy wound.

Oliver Pearce Robinson, M.D., Little Rock, Ark.; Bellevue Hospital Medical College, 1877; aged 63; a retired physician and planter; vice president of the German National Bank, Little Rock; died at his home, February 21, from cerebral hemorrhage.

George Glen Wood, M.D., Muncy, Pa.; Jefferson Medical College, 1872; aged 68; a charter member of the Lycoming County Medical Society, and a member of the state legislature from 1888 to 1892; died at his home, February 23.

William Walton Burnett, Wrentham, Mass. (license, Massachusetts, 1896); aged 68; a practitioner for forty-six years; while making a professional call, February 18, died suddenly from concussion of the brain due to a fall.

Thomas Edward Cunningham, M.D., Cambridge, Mass.; Harvard Medical School, 1883; aged 65; a Fellow of the American Medical Association; a specialist in internal medicine; died at his home, February 27.

Joseph L. Allred, Winters, Texas (license, Texas, Sixth Judicial District Board, 1889); aged 56; a Fellow of the American Medical Association; died at his home, January 13, from phlegmonous erysipelas.

Alfred Sylvester Bair, M.D., Bath, Ohio; University of Wooster, Cleveland, 1884; aged 52; a member of the Ohio State Medical Association; died at his home, February 26, from disease of the intestine.

Luke F. Magee, Huttig, Ark. (license, Arkansas, 1903); aged 43; physician to the Red River Lumber Company and Union Sawmill Company; died at Mineral Wells, Texas, February 20, from nephritis.

George H. T. Johnson, M.D., Atchison, Kan.; Homeopathic Medical College of Missouri, St. Louis, 1869; aged 73; a veteran of the Civil War; died in a hospital in Atchison, February 22.

Henry Thomas McCarthy, M.D., Lewiston, Me.; Medical School of Maine, Brunswick, 1901; aged 38; formerly a member of the Maine Medical Association; died at his home, February 19.

Charles Trumbull, M.D., Port Townsend, Wash.; University of Nebraska, Lincoln, 1885; aged 58; for four years instructor of anatomy in the University of Nebraska; died in Seattle, December 7.

Nicholas L. Toland, Martinsburg, Ohio (license, Ohio, years of practice, 1896); aged 85; a practitioner for fifty-four years; a veteran of the Civil War; died at his home, February 23.

John Edward O'Neil, M.D., Providence, R. I.; New York University, New York, 1892; a Fellow of the American Medical Association; died at his home, Providence, December 7.

Robert B. Taylor, M.D., Arcadia, Ohio; Western Reserve University, Cleveland, 1876; aged 68; a member of the Ohio State Medical Association; died at his home, February 24.

William Edward Buschman, M.D., Milwaukee, Wis.; University of Michigan, Ann Arbor, 1887; aged 51; died at his home, Dec. 17, 1916, from cerebral hemorrhage.

Orrin T. Stacy, M.D., Rochester, N. Y.; University of Buffalo, N. Y., 1860; aged 82; a member of the state legislature in 1875 and 1876; died at his home, February 21.

George J. Tankersley, Benton, Ark. (license, Arkansas, 1903); aged 80; for forty years a practitioner of Arkansas; a Confederate veteran; died at his home, February 3.

Francis P. Martin, M.D., Hannibal, Ohio; Cincinnati College of Medicine and Surgery, 1869; aged 79; died at his home, February 9, from cerebral hemorrhage.

James Taylor Walker, M.D., Falmouth, Mass.; University of Vermont, Burlington, 1879; aged 66; died at his home, January 12, from carcinoma of the rectum.

James W. Russey, M.D., Trenton, Ga.; Louisville (Ky.) Medical College, 1876; aged 66; died in a hospital in Chattanooga, Tenn., recently, from pellagra.

Philip Sack, M.D., Philadelphia; Medico-Chirurgical College of Philadelphia, 1913; aged 29; died at his home, November 5, from tuberculosis of the throat.

Charles Rolin Coffeen, M.D., Piqua, Ohio; Pulte Medical College, Cincinnati, 1878; aged 70; died at his home, February 16, from progressive paralysis.

Jacob S. Allen, Jr., M.D., Washington, D. C.; National Homeopathic Medical College, Washington, D. C., 1895; aged 51; died at his home, February 15.

U. Odell Jones, M.D., Rushylvania, Ohio; Eclectic Medical Institute, Cincinnati, 1898; aged 49; died at his home, January 23, from aneurysm of the aorta.

Martin L. Smiley, M.D., Catlettsburg, Ky.; Eclectic Medical Institute, Cincinnati, 1877; aged 74; a Confederate veteran; died at his home, February 23.

John B. Carder, M.D., Kiowa, Colo.; Long Island College Hospital, Brooklyn, 1876; aged 64; died in Asbury Hospital, Minneapolis, February 15.

Daniel S. Ashby, Paris, Texas (license, Texas Judicial District Board, 1907); aged 53; was shot and instantly killed in his home, February 23.

Edward P. Teague, M.D., New York; College of Physicians and Surgeons, Boston, 1899; aged 42; died at his home in New York, February 22.

John W. Prather, M.D., Woodland Mills, Tenn.; University of Louisville, Ky., 1872; aged 67; died at his home, February 10, from heart disease.

Victor A. Clement, M.D., Augusta, Me.; McGill University, Montreal, 1869; aged 72; died at his home, January 11, from cerebral hemorrhage.

Benjamin H. Price, M.D., Blackford, Ky.; Louisville (Ky.) Medical College, 1890; aged 63; died at his home, February 21, from meningitis.

David C. Schumann, M.D., Willmar, Minn.; King Frederick University, Christiania, Norway, 1871; aged 77; died at his home, February 16.

Charles A. Stafford, M.D., Indianapolis; Physio-Medical College of Indiana, Indianapolis, 1889; died at his home, January 13.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SUCCUS CINERARIA MARITIMA

Another Illustration of One of the Weaknesses of the Federal Food and Drugs Act

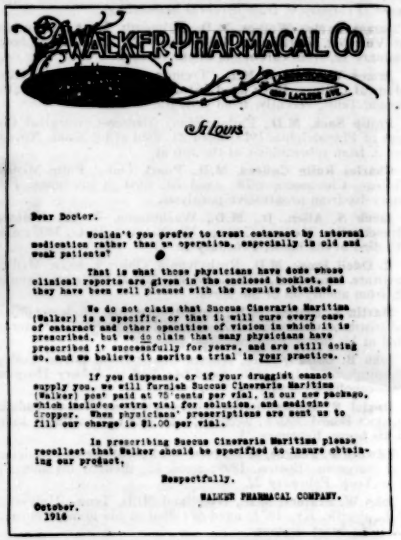
The Walker Pharmacal Company of St. Louis was, we understand, if it is not still, one of the subsidiary concerns of the Luyties Homeopathic Pharmacy Company. It has for years sold a nostrum, "Succus Cineraria Maritima," under the claim that by simply dropping this stuff into the eye twice daily cataract and other opacities of the eye will be cured. For instance:

". . . the only remedy for the relief of cataract and other opacities of vision, which stands before the medical fraternity on a firm foundation of accomplished results. . . ."

". . . possesses a specific power in removing the obstruction to vision."

"In this class of cases [cataract] physicians can place reliance on Succus Cineraria Maritima (Walker) which does not require the services of a specialist but is simply dropped into the eye with an ordinary medicine dropper twice daily. . . ."

". . . has been used with success in cataract, both lenticular and capsular, pterygium and opacities of the cornea, softening the opaque deposits, causing dissolution, and by its stimulating properties, hastening absorption."



WALKER PHARMACAL Co

St Louis

Dear Doctor.

Wouldn't you prefer to treat cataract by internal medication rather than an operation, especially in old and weak patients?

That is what those physicians have done whose clinical reports are given in the enclosed booklet, and they have been well pleased with the results obtained.

We do not claim that Succus Cineraria Maritima (Walker) is a specific, or that it will cure every case of cataract and other opacities of vision in which it is prescribed, but we do claim that many physicians have prescribed it successfully for years, and are still doing so, and we believe it merits a trial in your practice.

If you dispense, or if your druggist cannot supply you, we will furnish Succus Cineraria Maritima (Walker) post paid at 75 cents per vial, in our new package, which includes extra vial for solution, and medicine dropper. When physicians' prescriptions are sent us to fill our charge is $1.00 per vial.

In prescribing Succus Cineraria Maritima please recollect that Walker should be specified to insure obtaining our product,

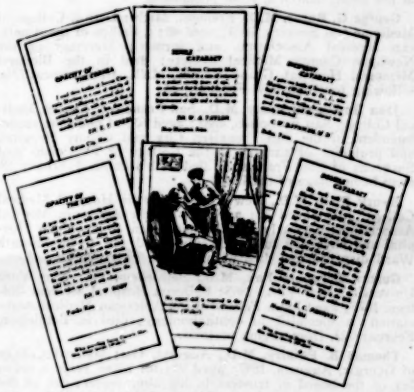
Respectfully,

WALKER PHARMACAL COMPANY.

October, 1916

Facsimile of a letter dated October, 1916, suggesting the use of "Succus Cineraria Maritima" as a cure for cataract and other opacities of vision. Eight months previously (February, 1916) the Walker Pharmacal Company had pleaded guilty to the charge that the claims that "Succus Cineraria Maritima" was a cure for cataract and other eye opacities were false and fraudulent and applied knowingly and in reckless and wanton disregard of their truth or falsity. The federal Food and Drugs Act does not apply to claims made in circular letters or elsewhere than in the trade package.

Succus Cineraria Maritima is advertised to the medical profession in true "patent medicine" style by means of testimonials from doctors, obscure and deceased. The preparation is valueless for the purposes for which it is sold and "has about as much effect on the dissolution or dispersal of opacities due to organic changes in the lens as pouring the same down the back of the patient's neck!" More than five years ago the Council on Pharmacy and Chemistry reported on the worthlessness of the drug, Cineraria Maritima, and, at the same time, THE JOURNAL pointed out that the drug would



Facsimile of some of the pages from the booklet that accompanied the letter reproduced in the next column. The obvious intent of this booklet was to lead physicians to believe that Succus Cineraria Maritima will cure "Opacity of the Cornea," "Opacity of the Lens," "Senile Cataract," "Incipient Cataract," "Double Cataract," etc.

have been forgotten long ago had it not been for the prodigal use of printers' ink by the Walker Pharmacal Company in advertising its Succus Cineraria Maritima.

These facts are given for the purpose of refreshing the memory of our readers and are but incidental to the object of this article. In due time the federal authorities proceeded against the Walker Pharmacal Company charging that Succus Cineraria Maritima was misbranded under the federal Food and Drugs Act. The government chemists reported that analysis "showed that the product was essentially an aqueous solution of glycerin, boric acid and vegetable drug extractives carrying tannin-like bodies." The direct and inferential claims made in the advertising matter accompanying the trade package were quoted by the federal authorities, who pointed out that the Walker Pharmacal Company was selling the nostrum under claims that would create in the minds of the purchasers the belief that Succus Cineraria Maritima was a remedy for cataract and other opacities of the eye causing impaired vision and that it was a cure for senile cataract, trachoma, secondary opacities, etc. These claims the government charged were "false and fraudulent in that the same were applied to the article knowingly, and in reckless and wanton disregard of their truth or falsity," because "in truth and in fact it was not, in whole or in part, composed of, and did not contain, such ingredients and medicinal agents" as would produce the therapeutic effects claimed.

These charges put the matter flatly up to the Walker Pharmacal Company. This company has for years been telling physicians that their stuff *could* and *would* do just what the federal authorities insisted it can *not* and will *not* do. Did the Walker Pharmacal Company attempt to defend its claims? Did it demonstrate that Succus Cineraria Maritima would cure cataract? Did it produce evidence of the numerous cases of recovery from blindness or partial blindness which must have been available if the preparation had the powers claimed for it? No! The Walker Pharmacal Company in February, 1916, pleaded guilty—and was fined a paltry $10 and costs.

This, however, is not the end of the story. The company was prosecuted because it had published the false and fraudulent claims in the trade package, thus bringing the claims within the purview of the federal Food and Drugs Act. Had the Walker Pharmacal Company confined its false statements to medical-journal advertisements, to the circular letters sent to physicians or to any other advertising matter not part of the trade package, it could have snapped its fingers at the Food and Drugs Act.

It was in February, 1916, that the Walker Pharmacal Company pleaded guilty to the charge of making false and fraudulent claims for Succus Cineraria Maritima. In October, 1916, they were still sending out circular letters to physicians urging the use of Succus Cineraria Maritima in the treatment of cataract and enclosing the usual booklet of testimonials claiming cures for cataract and other opacities of the lens and cornea!

Can one conceive a better illustration of the inadequacy of the Food and Drugs Act? The dishonest exploiter of proprietary medicines cares little that the law requires him to keep within certain bounds of truthfulness in the advertising that accompanies the trade package. It isn't the claims in the trade packages that sell the product; it's the advertising in medical journals, in circular letters, etc. Yet, the Food and Drugs Act offers no check or curb on false statements or fraudulent claims made for proprietary or "patent medicines" in any other place than the trade packages.

A few weeks ago THE JOURNAL called attention to a flagrant case of fraud and at that time it said: "It is justifiable to assume that when any man, whatever his business, admits in court that he has made fraudulent claims and then continues to make the same claims through channels that are not controlled by penal enactment, that man's standard of business ethics is such that the public needs protection against it. There are many such men in the 'patent medicines' world. The only way in which the public may properly be protected against being defrauded in such cases is for the federal Food and Drugs Act to have its scope extended to cover *all* advertising of the products coming under the purview of the act."

RHEUME OLUM

Report of the Council on Pharmacy and Chemistry

Rheume Olum (Rheumeolum Chemical Co., Seattle, Wash.) is sold as a "solid liniment," put up in collapsible tubes. It is said by the manufacturers to be composed of camphor 7 per cent., chloral hydrate 7 per cent., menthol 2⅛ per cent., methyl salicylate 25 per cent., oil cajuput 2½ per cent., oleoresin capsicum, lanolin, white wax, "qs."

The amount of the powerful constituent, oleoresin of capsicum, is not declared. It is claimed that Rheume Olum "is especially indicated in Rheumatism, Sprains, La Grippe, Tonsilitis, Pleurisy, Otitis, Neuritis, Lumbago, Lame Back, Pneumonia, Bronchitis, Ovarian and all other kinds of Neuralgia, Chest and Throat diseases," and "mild attacks of Appendicitis" are said to have "responded quickly." It is claimed further, that ". . . in any case of rheumatic diathesis or where a counter-irritant, anodyne, rubifacient, or anti-phlogistic remedy is indicated, nothing will more fully meet such requirements." There is no warrant for the claim that this, or any other fixed combination, is indicated whenever a "counter-irritant, anodyne, rubifacient or anti-phlogistic remedy" is required.

The name of the preparation is nondescriptive of its composition. The rules of the Council provide that in the interest of intelligent prescribing, pharmaceutical mixtures of well-known drugs must bear names descriptive of their composition. The name also suggests "rheumatism oil," thus inviting the use of the preparation as a treatment for rheumatism without consideration of its composition.

Rheume Olum is an irrational mixture, as there is no reason for the fixed combination of the several ingredients said to be present. The exploitation of mixtures such as this is conducive to the irrational and haphazard use of drugs. The tendency is well illustrated by the following from the advertising:

"When using Rheume Olum it is not necessary to eliminate other medication, but is advisable to use it in conjunction with such recognized medication."

"What better combination of drugs can be compounded, which will meet the numerous requirements of the busy physician."

In view of the various conflicts with the rules of the Council "Rheume Olum" was declared not acceptable for admission to New and Nonofficial Remedies.

Correspondence

Compulsory Health Insurance

To the Editor:—In reply to numerous requests from medical correspondents throughout the country regarding the merits of the present propaganda for compulsory health insurance, the following statement has been prepared, which may be of interest to the medical profession at large:

1. As regards the point of view of organized labor, it is asserted by Prof. Irving Fisher, president of the American Association for Labor Legislation, which is primarily responsible for the present propaganda, that "the greater part of labor men and labor organizations who have seriously studied the subject have favored health insurance." (Newark *Evening News*, Jan. 15, 1917.) In flat contradiction to this statement is the strong opposition of the American Federation of Labor, as presented in convincing arguments by its president, Mr. Samuel Gompers, by a unanimous resolution of the executive committee adopted by the last annual convention of the federation, and the conclusions advanced by Mr. Warren S. Stone, grand chief, International Brotherhood of Locomotive Engineers, and of Mr. Matthew Wohl, president of the Photo-Engravers' International Union, and of other representatives of organized labor.

2. It is asserted by the secretary of the American Association for Labor Legislation in the *Forecast*, August, 1916, that "the National Association of Manufacturers has endorsed a plan for health insurance." In flat contradiction of this statement are the arguments advanced by Mr. A. Parker Nevin, counsel of the National Association of Manufacturers, strongly opposing compulsory insurance as inimical to American industry. To the same effect is a resolution of the Chamber of Commerce of the State of New York, reading in part "this chamber is opposed to the passage of Senate Bill 69, and opposed to the passage of any similar bill at this time." Strong opposition has also been offered by the New York Board of Trade and Transportation and the social insurance department of the National Civic Federation, composed of representatives of organized labor, organized industries and the interests of the general public, declaring itself "opposed to the contemplated legislation with reference to compulsory health insurance as inimical to the best interests, present and future, of the workers of the nation" (adopted Feb. 20, 1917).

3. It has been asserted by Dr. Ira S. Wile, in a paper on "Health Insurance from the Viewpoint of the Physician," that "as far as the general proposition of health insurance is concerned, it may be admitted that physicians in general are in favor of it." This assertion is in flat contradiction to the fact that the American Medical Association has adopted no resolutions on the subject one way or the other; that according to the special inquiry of Dr. Delphey of New York, twenty-four state societies had taken no action with reference to the matter, four were decidedly opposed, two were indifferent, and only two were distinctly favorable. Furthermore, the New York County Medical Association adopted a recent resolution to the effect that "this society disapproves of the medical provisions of the bill for compulsory health insurance and the appointment of a legislative commission to study the subject, and directs its Committee on Legislation and delegates to the Medical Society of the State of New York to take proper measures to oppose its passage by the legislature." Of equal importance is the unanimous report of a special committee of the Chicago Medical Society, adopted Feb. 13, 1917, in which it is said that compulsory health insur-

ance will affect the professional income, lower the professional moral tone, decrease professional efficiency, destroy incentive for medical research, make a dissatisfied profession, prove productive of malingering, and destroy personal relationships between patient and physician.

Thus, briefly restated, organized labor is *not* in favor of compulsory health insurance, but opposed to it; organized industry and business interests are *not* in its favor, but opposed to it; and the organized medical profession is *not* in its favor, but opposed to it.

The argument is advanced that health insurance diminishes illness and that "as a public health measure this is one of the most important bills which has come before the legislature (of the state of New York) for many years." There is no evidence that any of the measures proposed aim specifically and effectively at a well considered plan of coordination of compulsory health insurance and public health administration. In flat contradiction to the assertion is the official statement of the surgeon-general of the U. S. Public Health Service in his annual report for 1916, that "as yet none of the legislative measures proposed has contained anything more than provisions for the relief of sickness." The endorsement of compulsory health insurance by the U. S. Public Health Service provides for the coordination of the proposed organization with national, state and local health agencies. No bills as yet introduced provide for such a plan of administrative coordination. Nor has there been a comprehensive and far-reaching administrative coordination in any one of the foreign countries in which compulsory health insurance has been established.

FREDERICK L. HOFFMAN, Statistician, Newark, N. J.

Ankylosis of Hips as Indication for Cesarean Section

To the Editor:—Newell, in his article on "The Present Status of Abdominal Cesarean Section" (THE JOURNAL, Feb. 24, 1917, p. 604), gives as an indication for the abdominal operation "some obstruction to delivery or the presence of some condition which renders the abdominal route the safer one for mother or child." A recent cesarean section at the Sabetha Hospital presented a most unusual "obstruction to delivery," and one which is certainly seldom met.

Mrs. U., aged 42, a primipara at full term, was admitted to the obstetric ward of the Sabetha Hospital, Jan. 28, 1917. On examination she was found to have complete ankylosis of both hips, and it was impossible to make a satisfactory vaginal examination because there could be neither abduction nor flexion of the thighs. External measurements showed a contracted pelvis, but because of the ankylosis there could be no natural delivery even with a normal pelvis. A cesarean section was performed, January 31, and mother and baby left the hospital, February 21.

This case presented another interesting fact in that the father of the baby is 72 years old.

W. R. DILLINGHAM, M.D., Sabetha, Kan.

Milk-Borne Infections

To the Editor:—THE JOURNAL, Aug. 26, 1916, p. 683, commented editorially on an epidemic of infectious sore throat in an Eastern city directly traceable to a single milk supply. I was led to take up an investigation of this epidemic, first, because the sole evidence of proof was the occurrence of sore throat in the three communities reached by this milk supply, together with the finding of a person with sore throat on that farm at the time of the investigation. Secondly, a personal knowledge of the probable source of the trouble in two of the three communities, coupled with the fact that the producer was later found by me to be in the Class A certified class without the certification, was sufficient reason to demonstrate to the producer, for his own satisfaction, whether or not his milk was the source. An investigation extending over four months with data, it is true, which were not obtainable at the time the original investigation was made, gave absolutely definite evidence that there had not been a milk-borne epidemic. In the interests of those few producers who may have a promising business for infant's food ruined, in this case a business run by a college graduate, with milk from a thoroughbred Guernsey herd, I trust that you will add through your columns this small contribution to justice. I would add that there should also be handed to every health officer before investigation of milk-borne infections, from now on, a reprint of Dr. E. R. Kelley's article on "The Quantitative Relationship of Milk-Borne Infection in the Transmission of Human Communicable Diseases" (THE JOURNAL, Dec. 30, 1916, p. 1997), as well as Schneider's "Shortcomings of Socio-Sanitary Investigations."

D. M. LEWIS, M.D., New Haven, Conn.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

BUSILA'S SERODIAGNOSIS OF SYPHILIS

To the Editor:—Reference was made in THE JOURNAL, Nov. 6, 1915, p. 1682, to an article on "Improved Technic for Serodiagnosis of Syphilis," by V. Busila. Please give a detailed description of the method and references.

R. DEL VALLE SARRAGA, San Juan, Porto Rico.

ANSWER.—THE JOURNAL published at the time the following summary of the article in question:

Busila relates that syphilitic serum may contain a sensitizer that resists heating and also one that is destroyed by heat. The deviation of complement and Wassermann tests do not discriminate with sufficient precision between these two sensitizers, while the preponderance or absence of one or the other has a pronounced influence on the outcome of the tests. In order to eliminate error from this source, Busila has modified the technic and states that his method is applicable to all serums and requires only two hours or two and a half from the moment the blood is drawn. Instead of heating, to suppress the human complement, he titrates it simultaneously with the reaction. When the serum is heated this destroys the thermolabile sensitizer, and it is in the cases in which this sensitizer predominates that the syphilis is most difficult to diagnose. Hence his modified technic is particularly useful, he declares, in cases of latent, imperfectly treated, or "nervous" syphilis.

V. Busila is chief of the bacteriologic section of the Pathologic Institute of Bucharest. His first publication on this subject was in a local journal, Oct. 10, 1910, but an account was published in the *Comptes Rendus de la Société de Biologie*, Dec. 7, 1910. He calls his method the Bauer-Hecht-Busila method. It titrates the complement in the guinea-pig serum and uses only the amount needed in the individual instance. His communication in the *Presse Médicale* was entitled "Une 'sensibilisatrice' syphilitique thermolabile. Modification de la technique Bordet-Gengou-Wassermann." He shows the technic by a table as follows:

Sets of Test Tubes	Sodium Chlorid Solution 0.9 per 100	Extract of Syphilitic Liver	Fresh Serum from the Patient. Not Inactivated[1]	Fresh Guinea-Pig Serum, Diluted 1:10[2]	Hemolytic Amboceptor[3]	Five per Cent. Suspension of Sheep Corpuscles[4]
1 a	0.9	...	0.1	0.5 or 0.6 or 0.3	0.5	0.5
b	0.8	0.1	0.1	0.5 or 0.8 or 0.3	0.5	0.5
2 a	1.0	...	0.1	0.4 or 0.6 or 0.2	0.5	0.5
b	0.9	0.1	0.1	0.4 or 0.6 or 0.2	0.5	0.5
3 a	1.1	...	0.1	0.3 or 0.4 or 0.15	0.5	0.5
b	1.0	0.1	0.1	0.3 or 0.4 or 0.15	0.5	0.5
4 a	1.2	...	0.1	0.2 or 0.25 or 0.1	0.5	0.5
b	1.1	0.1	0.1	0.2 or 0.25 or 0.1	0.5	0.5
5 a	1.3	...	0.1	0.1 or 0.15 or 0.05	0.5	0.5
b	1.2	0.1	0.1	0.1 or 0.15 or 0.05	0.5	0.5
6 a	1.4	...	0.1	0 0 0	0.5	0.5
b	1.3	0.1	0.1	0 0 0	0.5	0.5

1. After adding fresh guinea-pig serum incubate at 38 C. for 55 minutes, then add hemolytic amboceptor as noted.
2. Varying according to the proportion of alexin in the guinea-pig serum.
3. Variably according to the hemolytic titer of the human serum.
4. Incubate at 38 C.

The index is the last tube in which the control tube (*a*) shows complete hemolysis. Immediately after the blood is drawn, before coagulation has occurred, he incubates the tube, placed at a considerable slant, at 35 or 37 C. In half an hour, sometimes in fifteen minutes, the serum has separated out and the serodiagnostic test can then be applied.

THE SUPPLY OF SALVARSAN

To the Editor:—Kindly inform me where I can obtain the Canadian preparation of salvarsan and neosalvarsan. I am experiencing some difficulty in getting enough of the German preparation.

S. H. ROSENTHAL, M.D., Lynchburg, Va.

ANSWER.—Many medical supply houses now sell the Canadian product. It may also be ordered directly from the manufacturers, The Diarsenol Company, Limited, Toronto, Canada. However, we have received a communication from the American agents for salvarsan stating that they have a sufficient supply available and that the product may be ordered directly from them. Address the Farbwerke-Hoechst Company, 111 Hudson Street, New York City.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, April 3-4. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.

CALIFORNIA: Los Angeles, April 10. Sec., Dr. Charles B. Pinkham, 529 Forum Bldg., Sacramento.

COLORADO: Denver, April 3. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, April 10. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

IDAHO: Boise, April 3. Sec., Dr. Charles A. Dettman, Burke.

MINNESOTA: Minneapolis, April 3-6. Sec., Dr. Thomas S. McDavitt, 741 Lowry Bldg., St. Paul.

MISSOURI: St. Louis, March 26-28. Sec., Dr. J. A. B. Adcock, 325 E. High St., Jefferson City.

MONTANA: Helena, April 3. Sec., Dr. W. C. Riddell, Helena.

OKLAHOMA: Oklahoma City, April 10-11. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

PORTO RICO: San Juan, April 2. Sec., Dr. Quevedo Baez, San Juan.

RHODE ISLAND: Providence, April 5-6. Sec., Dr. Gardner T. Swarts, State House, Providence.

UTAH: Salt Lake City, April 2. Sec., Dr. G. F. Harding, 407 Templeton Bldg., Salt Lake City.

Amendments to Medical College Requirements in Illinois

The schedule of minimum requirements for medical colleges in good standing with the Illinois State Board of Health was amended recently in two particulars. At the meeting held Nov. 10 and 11, 1916, the board voted to require, after July 1, 1917, a six-year medical course. The first five sessions are to extend over five calendar years, and fifty months must have elapsed between the commencement of the first session and the ending of the fifth. No two sessions of the first five years can begin or end within any consecutive eighteen months, except that the first two sessions may be embraced in sixteen months. The sixth, or final year is to consist of a hospital internship of not less than twelve months' duration, in a hospital approved by the board.

In order that the rule regarding the intern year may accord with the medical practice act, the following procedure is necessary: On the completion of the premedical year and the four-year medical course, each candidate for graduation shall pass the regular licensing examination of the Illinois board, and shall receive a limited license which authorizes him to serve as an intern in a hospital, but which does not authorize him to practice in any other manner or place in Illinois. This limited license will remain in force not exceeding eighteen months from the date of issue. At the expiration of the limited license, or on completion of the twelve months' intern service, the candidate will surrender the limited license, and on presentation of evidence that the internship has been satisfactorily completed and of a diploma from the medical college, and provided that all requirements and rules of the board have been satisfactorily complied with, will receive in lieu thereof a permanent certificate to practice medicine in the state of Illinois, without further examination or fee.

At the meeting held Jan. 27, 1917, the conditions for admission to medical colleges were amended. The clause requiring a certificate of successful examination for admission to the freshman class of a regular literary or scientific college was amended by adding the words "with evidence of actual admission and attendance in said college." This is to provide for the securing of evidence in case the first year of the five-year medical course has been obtained in a college of arts and science and to prevent any institution from taking advantage of this provision by examining a student for admission to their department of arts and sciences and immediately matriculating him in the medical department.

South Carolina June Report

Dr. A. Earle Boozer, secretary of the State Board of Medical Examiners of South Carolina, reports the written examination held at Columbia, June 13-15, 1916. The total number of subjects examined in was 16; total number of questions asked, 105; percentage required to pass, 75. The total number of candidates examined was 62, of whom 43 passed and 19 failed, including 1 osteopath. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Atlanta Medical College (1914) 75; (1915) 75.7; (1916) 81.9, 82.2, 87.2		
Atlanta School of Medicine	(1910)	77.4
Southern College of Med. and Surgery ....(1913) 75; (1914)		75
University of Georgia	(1916)	82.1
Johns Hopkins University	(1914) 86.5; (1916) 77.1,	83.6
Maryland Medical College	(1905)	75
University of Maryland (1916) 75.7, 78.7, 82.4, 84.1, 89, 89.6.		
North Carolina Medical College	(1914)	77.9
Jefferson Medical College	(1916) 85,	85.4
University of Pennsylvania	(1916)	88.4
Medical College of the State of South Carolina (1916) 77.2, 78.9, 79.2, 79.4, 79.6, 80.7, 83.4, 83.9, 83.9, 84.5, 84.6, 85, 85.2, 86.6, 87.1		
University of West Tennessee	(1914)	76
Medical College of Virginia (1916) 75, 75.6, 78.1, 82.4.		
FAILED		
Birmingham Medical College	(1915)	68.4
Atlanta College of Physicians and Surgeons	(1912)	71
Atlanta Medical College	(1914) 69.6; (1915)	64.4
Southern College of Medicine and Surgery	(1914)	67.7
University of Georgia	(1914)	72
North Carolina Medical College	(1914)	65.9
University of Oklahoma	(1915)	68.6
Medical College of the State of South Carolina (1895) *; (1900) (1901) 55.1; (1910) *.		67.5;
Meharry Medical College (1907) 55.6; (1909) 67.9; (1916)		69.7
Memphis Hospital Medical College	(1911) 58.1,	64.5
University of Tennessee	(1905)	54.1

* No grade given.

Maine November Report

Dr. Frank W. Searle, secretary of the Maine State Board of Registration of Medicine, reports the written examination held at Portland, Nov. 14-15, 1916. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 4, all of whom passed. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Howard University	(1909)	80
Baltimore Medical College	(1896)	80
Harvard University	(1913)	87
Laval University	(1916)	77

Massachusetts November Report

Dr. W. P. Bowers, secretary of the Massachusetts Board of Registration in Medicine, reports the oral, practical and written examination held at Boston, Nov. 14-16, 1916. The total number of subjects examined in was 13; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 54, of whom 32 passed, including 1 osteopath, and 22 failed, including 9 osteopaths. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
George Washington University Medical School	(1909)	75.1
Chicago College of Medicine and Surgery	(1914)	78.1
Baltimore Medical College	(1909)	75
Coll. of Phys. and Surgs., Baltimore ....(1913) 75.6; (1915) 80.8,		83
University of Maryland	(1916) 77.7,	83.4, 84.3
Boston University	(1915) 76.9; (1916) 76.2,	84.7
College of Phys. and Surgs., Boston*	(1916)	76.6

Harvard University	(1915) 75.1; (1916) 76.1, 83.2	
Tufts College Medical School (1913) 75; (1915) 77.1; (1916) 75.3, 77.2, 78.2, 79.5, 81		
Dartmouth Medical School	(1914)	77.3
Albany Medical College	(1914)	79.6
Long Island College Hospital	(1899)	75
N. Y. Homeo. Med. Coll. and Flower Hosp.	(1912)	77.3
Woman's Med. Coll. of Pennsylvania	(1899) 75; (1915)	81.4
University of Vermont	(1915)	77.6
McGill University	(1916)	80.2
FAILED		
Chicago College of Medicine and Surgery	(1916)	66.5
Loyola University	(1916)	73.5
College of Phys. and Surgs., Boston*	(1913) 54.6; (1915) 59.6; (1916) 61.5, 62.7	
Tufts College Medical School	(1916)	72
Columbia University	(1892)	53.5
N. Y. Homeo. Med. Coll. and Flower Hosp.	(1916)	68
Medico-Chirurgical College of Philadelphia	(1916)	67.2
University of Vermont	(1912)	66.7
University of Berlin	(1903)	54.8
University of Naples	(1912)	60.7

* Reported not recognized by the Massachusetts Medical Society.

Rhode Island November Report

Dr. Gardner T. Swarts, secretary of the Rhode Island State Board of Health, reports the practical and written examination held at Providence, Nov. 15-16, 1916. The total number of subjects examined in was 7; total number of questions asked, 63; percentage required to pass, 80. The total number of candidates examined was 7, all of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Tufts College	(1915) 82.3, 82.5;	(1916) 80.1,	89.4
Jefferson Medical College of Philadelphia	(1912) 92.6;	(1916)	91
University of Vermont		(1916)	86.6

South Carolina November Report

Dr. A. Earle Boozer, secretary of the State Board of Medical Examiners of South Carolina, reports the written examination held at Columbia, Nov. 14-16, 1916. The total number of subjects examined in was 16; total number of questions asked, 105; percentage required to pass, 75. The total number of candidates examined was 28, of whom 11 passed, including 1 osteopath, and 17 failed, including 1 osteopath. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Howard University		(1916)	75.1
Atlanta Medical College	(1915) 77;	(1916) 75,	83
University of Georgia		(1914)	75
University of Maryland	(1909) 75;	(1915)	79.7
Harvard University		(1913)	81.5
Medico-Chirurgical College of Philadelphia		(1915)	84.4
Meharry Medical College		(1916)	81.6
FAILED			
Birmingham Medical College		(1915)	66.7
Atlanta College of Physicians and Surgeons		(1912)	71.2
Atlanta Medical College	(1914) 70.7;	(1915)	65.6
Southern College of Medicine and Surgery		(1914)	66.6
Loyola University		(1916)	67
Woman's Medical College of New York Inf.		(1899)	67.1
North Carolina Medical College		(1910)	67
University of Oklahoma		(1915) 70.2,	70.4
Meharry Medical College	(1914) 70.4;	(1916)	70
Memphis Hospital Medical College		(1914) 55.5,	59.5
University of Tennessee		(1905)	47.7
Medical College of Virginia		(1916)	61.4

Delaware December Report

Dr. Henry W. Briggs, chairman of the Medical Council of Delaware, reports the written examination held at Dover and Wilmington, Dec. 12-14, 1916. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 7, of whom 6 passed and 1 failed. Three candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Johns Hopkins University		(1916)	84.7
New York Homeo. Med. Coll. and Flower Hosp.		(1915)	85.5
Hahnemann Med. Coll. and Hosp. of Philadelphia		(1916)	87.7
Medico-Chirurgical Coll. of Philadelphia	(1915) 80.1;	(1916)	87.3
University of Pennsylvania		(1913)	85.5
FAILED			
University of Naples		(1914)	68

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Columbian University		(1898)	Dist. Colum.
University of Pennsylvania		(1889) (1913)	Penna.

Book Notices

THE CLINICAL DIAGNOSIS OF INTERNAL DISEASES. By Lewellys F. Barker, M.D., LL.D., Professor of Medicine, Johns Hopkins University. Three Volumes. Cloth. New York: D. Appleton & Co., 1916.

Dr. Barker's work is limited wholly to diagnosis, but such limitation does not mean that the work is of limited scope, for clinical diagnosis involves an extensive knowledge of anatomy, physiology, pathology, chemistry and laboratory methods; in fact, every phase of the practice of medicine except therapeutics. If there is an actual science of medicine, that science has reached its highest development in diagnosis. The clinician of wide experience who has at his ready command the knowledge which enables him to outline the findings of his complete examination and then to name the disease condition is practicing scientific medicine.

The book is issued in three volumes divided into numerous parts: The first part concerns history at examination and general importance of diagnostic methods; the second part is devoted wholly to the use of the Roentgen ray; the third part, to the various fluids of the body, giving in detail the methods of obtaining these fluids and of examining them; the fourth part concerns the infectious diseases and those due to external physical causes; the fifth part, diseases of the respiratory tract, and the sixth part, the diseases of the circulatory system. Each section is accompanied by an important list of bibliographic references which the author has selected with a view to their historical importance, their accessibility and their newness.

Of especial interest in the first volume is the section on methods of examining the movements of the heart and blood vessels. The clinician to whom McKenzie's ink polygraph and Erlanger's apparatus and the electrocardiograph are merely mechanical curiosities will find here excellent illustrations of these instruments, with outlines of their importance and usefulness in actual diagnosis, and the pages which follow are profusely illustrated with examples taken from the work of these instruments. Volume II is devoted to the blood, digestive system and urology, and Volume III to muscles, bones, joints, the nervous system and metabolism.

To attempt a complete review of this extensive work, even were unlimited space available would, no doubt, be futile. There are points on which every one would not agree with the author. There are, perhaps, omissions of work which to some has seemed significant, and inclusion of other studies which are possibly questionable. But the large amount of exceedingly valuable material, well written and well presented, far exceeds any minor faults which the books may contain. The articles are accompanied with numerous illustrations, many of them in color, the type is large and easily readable, and there are numerous subheadings which enable rapid reference to any subject. Professor Barker has prepared a monumental work, and the publishers have done their share in presenting a work that is a credit to American medicine.

THE SURGICAL CLINICS OF CHICAGO. Volume I, Number 1. Published bimonthly. Cloth. Price per year, $14. Pp. 221, with 83 illustrations. Philadelphia: W. B. Saunders Company, 1917.

"The Surgical Clinics of Chicago" is in a way a successor of the Surgical Clinics of Dr. John B. Murphy, which naturally ended with the death of their distinguished author. The first number contains clinics by Drs. A. D. Bevan, A. J. Ochsner, E. Wyllys Andrews, L. L. McArthur, Dean D. Lewis, Carl Beck, Allen B. Kanavel, D. N. Eisendrath, Kellogg Speed, S. C. Plummer, E. W. Ryerson and D. B. Phemister.

The clinics are interesting and instructive. The physician of imagination can picture the patients, can follow the steps of the operation and can, perhaps, learn better from these clinics some of the surgery which is described than he could have learned from an upper seat in the amphitheater when the clinic was given. This is especially true because of the numerous excellent pictures.

The *British Journal of Surgery*, recently reviewing the Murphy Clinics as a whole, notes that the first issues were marked by somewhat careless and indifferent editing, but that

latterly this condition had greatly improved. The first issue of the Surgical Clinics of Chicago is marked by many striking features; conspicious among these are the profuseness and excellence of the illustrations, the extensive surgical material offered by the Chicago surgeons, and the somewhat indifferent editing or literary style. It is, of course, impossible to duplicate the intonation of the surgeon's voice, his gestures, and his eccentricities of speech or of action. Would it not be better, then, to edit the reading matter of the clinics in literary style, deleting useless words, verbal eccentricities, and rambling repetitions?

WATER-SUPPLY (CONSIDERED PRINCIPALLY FROM A SANITARY STANDPOINT). By William P. Mason, Professor of Chemistry, Rensselaer Polytechnic Institute. Fourth Edition. Cloth. Price, $3.75 net. Pp. 528, with illustrations. New York: John Wiley & Sons, 1916.

After outlining the methods used in ancient times to insure a supply of pure water, the author discusses drinking water and water-borne diseases, and describes natural and artificial means of purifying water and making it safe. Purification, storage and distribution of water for large communities throughout the world are completely reviewed, different types of purification plants being illustrated and described. Results obtained with different methods are tabulated. Many examples of the inception of water-borne diseases and epidemics are given. All these subjects are presented so interestingly that the reader, even though not versed in the technicalities of the subject, will enjoy the book and profit by reading it. Methods of water analysis capable of ready application by the field sanitarian with simple portable apparatus have not been considered. The author may not be in sympathy with rough and ready methods so often needed by field men. While this may be considered an omission in the light of present day advances in field sanitation work, it is probable that these matters of smaller import should not have place in a work of this size.

GUNSHOT WOUNDS: HOW THEY ARE INFLICTED, THEIR COMPLICATIONS AND TREATMENT. By Colonel Louis A. La Garde, United States Army Medical Corps (Retired). Second Edition. Cloth. Price, $4. Pp. 457, with 139 illustrations. Prepared under the Direction of the Surgeon General United States Army and Published by Authority of the Secretary of War. New York: William Wood & Co., 1916.

Owing to the unprecedented production of gunshot wounds in the two years which have elapsed since the publication of the first edition of this book, the author feels that any work on gunshot injuries, no matter how recently produced, requires extensive additions. He has revised somewhat the chapter on infection of gunshot wounds, and has largely rewritten the chapter on the general treatment of gunshot wounds, so as to include a description of the methods used by Alexis Carrel, Sir A. E. Wright, Col. H. M. W. Gray, and others at the front. Further additions are found in the chapters on the treatment of gunshot wounds of the chest and of the abdomen. A chapter on the war gives statistics of losses, etc., up to the time the book went to press. While it is acknowledged that the figures are far from being complete and that they are made from general estimates, rather than from official sources, they are quite interesting and show the enormous loss of life which has already taken place.

OBSTETRICS. A Practical Text-Book for Students and Practitioners. By Edwin Bradford Cragin, A.B., A.M., M.D., Professor of Obstetrics and Gynecology, College of Physicians and Surgeons, Columbia University, New York. Assisted by George H. Ryder, A.B., M.D., Instructor in Gynecology, College of Physicians and Surgeons, Columbia University, New York. Cloth. Price, $6 net. Pp. 858, with 512 illustrations. Philadelphia: Lea & Febiger, 1916.

Through his experience as a teacher of obstetrics and gynecology and as the medical head of Sloane Hospital for Women, where over 1,800 deliveries occur annually, the author is well qualified to present a practical textbook on these subjects. Recognizing that many textbooks are too large for the student, he has omitted lengthy discussion and has covered the subjects concisely. The illustrations of the subject of abortion are new and so well done that the student cannot help but understand. The author has wisely placed the subject of pelvimetry and antepartum examinations under the management of normal pregnancy.

Social Medicine, Medical Economics and Miscellany

THE ILLINOIS CONSOLIDATION BILL BECOMES A LAW*

The so-called consolidation bill which has just become a law in Illinois is to be known legally as "the Civil Administrative Code of Illinois." It provides for nine departments of the state government, namely, Finance; Agriculture; Labor, Mines and Minerals; Public Works and Buildings; Public Welfare; Public Health; Trade and Commerce; Registration, and Education. Each department is to have a director as its head. The directors of the Departments of Finance, Public Works and Buildings, Public Welfare, and Trade and Commerce receive $7,000 a year; the directors of the Departments of Agriculture, and Public Health receive $6,000 a year, and the directors of the Departments of Labor, Mines and Minerals, and Registration and Education receive $5,000 a year. In both the Departments of Public Health and of Registration and Education, provision is made for assistant directors, with salaries of $3,600. In the Department of Public Health, provision is made for a board of public health advisers composed of five persons.

The following extracts from the law give the most important provisions regarding the two departments in which physicians are most interested:

DEPARTMENT OF PUBLIC HEALTH

The director of public health shall be a person licensed to practice medicine and surgery in this state and shall have had at least five years' practical experience in the practice of medicine and surgery in this state and at least six years' practical experience in public health work.

The assistant director of public health shall be a person licensed to practice medicine and surgery in this state and shall have had at least five years' practical experience in the practice of medicine and surgery in this state and at least three years' practical experience in public health work.

Neither the director, assistant director, superintendent of registration, nor any other executive and administrative officer in the department of registration and education shall be affiliated with any college or school of medicine, pharmacy, dentistry, nursing, optometry, embalming, barbering, veterinary medicine and surgery, architecture, or structural engineering, either as teacher, officer or stockholder, nor shall he hold a license or certificate to exercise or practice any of the professions, trades or occupations regulated.

ALL FEES TO GO INTO STATE TREASURY

The gross amount of money received by every department, from whatever source, belonging to or for the use of the state, shall be paid into the state treasury, without delay, not later in any event than ten days after the receipt of the same, without any deduction on account of salaries, fees, costs, charges, expenses or claim of any description whatever. No money belonging to, or for the use of, the state shall be expended or applied by any department except in consequence of an appropriation made by law and upon the warrant of the auditor of public accounts.

POWERS OF THE DEPARTMENT OF PUBLIC HEALTH

The department of public health shall have power:

To exercise the rights, powers and duties vested by law in the state board of health, its secretary and executive officer, other officers and employees, except the rights, powers and duties vested by law in the state board of health under the act to regulate the practice of medicine and the act to regulate the practice of embalming;

To have the general supervision of the interests of the health and lives of the people of the state;

To act in advisory capacity relative to public water supplies, water purification works, sewerage system, and sewage treatment works, and to exercise supervision over nuisances growing out of the operation of such water and sewage works, and to make, promulgate and enforce rules and regulations relating to such nuisances;

To make such sanitary investigations as it may, from time to time, deem necessary for the preservation and improvement of public health;

To make examinations into nuisances and questions affecting the security of life and health in any locality in the state;

To maintain chemical, bacteriological and biological laboratories, to make examinations of milk, water, sewage, wastes, and other substances and to make such diagnosis of diseases as may be deemed necessary for the protection of the people of the state;

To purchase and distribute free of charge to citizens of the state diphtheria antitoxin, typhoid vaccine, smallpox vaccine and other sera, vaccines and prophylactics such as are of recognized efficiency in the prevention and treatment of communicable diseases;

* Compare Progressive Legislation in Illinois, Current Comment, THE JOURNAL A. M. A., this issue, p. 855.

To obtain, collect and preserve such information relative to mortality, morbidity, disease and health as may be useful in the discharge of its duties or may contribute to the promotion of health or to the security of life in this state;

To make investigations and inquiries with respect to the causes of disease, especially epidemics, and to investigate the causes of mortality and the effect of localities, and other conditions upon the public health, and to make such other sanitary investigations as it may deem necessary for the preservation and improvement of the public health;

To keep informed of the work of local health officers and agencies throughout the state;

To promote the information of the general public in all matters pertaining to public health;

To supervise, aid, direct and assist local health authorities or agencies in the administration of the health laws;

To enlist the cooperation of organizations of physicians and other agencies for the promotion of the public health in the improvement of health and sanitary conditions throughout the state;

To make sanitary, sewage, health and other inspections and examinations for the charitable, penal and reformatory institutions and the normal schools;

To inspect, from time to time, all hospitals, sanitaria, and other institutions conducted by county, city, village or township authorities, and to report as to the sanitary conditions and needs of such hospitals, sanitaria and institutions to the official authority having jurisdiction over them;

To print, publish and distribute documents, reports, bulletins, certificates and other matter relating to the prevention of diseases and the health and sanitary condition of the state.

DEPARTMENT OF REGISTRATION AND EDUCATION

The department of registration and education shall have power:

To exercise the rights, powers and duties vested by law in the board of education of the state of Illinois, the board of trustees of the Southern Normal University at Carbondale, the board of trustees of the Northern Illinois State Normal School at DeKalb, the board of trustees of the Eastern Illinois State Normal School at Charleston, and the board of trustees of the Western Illinois State Normal School at Macomb;

To exercise the rights, powers and duties vested by law in the board of veterinary examiners and the state board of live stock commissioners relating to the practice of veterinary medicine and surgery in the state of Illinois;

To exercise the rights, powers and duties vested by law in the board of examiners of horseshoers;

To exercise the rights, powers and duties vested by law in the state board of examiners of architects;

To exercise the rights, powers and duties vested by law in the state board of examiners of structural engineers;

To exercise the rights, powers and duties vested by law in the state board of health relating to the practice of medicine, or any of the branches thereof, or midwifery;

To exercise the rights, powers and duties vested by law in the state board of health relating to the regulation of the embalming and disposal of dead bodies, and for a system of examination, registration and licensing of embalmers;

To exercise the rights, powers and duties vested by law in the state board of pharmacy;

To exercise the rights, powers and duties vested by law in the Illinois State Board of Dental Examiners;

To exercise the rights, powers and duties vested by law in the Illinois State Board of Nurse Examiners;

To exercise the rights, powers and duties vested by law in the state board of optometry;

To exercise the rights, powers and duties vested by law in the state board of barber examiners, its officers and employees;

To investigate and study the natural resources of the state and to prepare plans for the conservation and development of the natural resources and for that purpose the officers and employees thereof may enter and cross all lands in this state, doing no damage to private property;

To cooperate with and advise departments having administrative powers and duties relating to the natural resources of the state, and to cooperate with similar departments in other states and with the United States government;

To conduct a natural history survey of the state, giving preference to subjects of educational and economic importance;

To publish, from time to time, reports covering the entire field of zoology and botany of the state;

To maintain a state museum, and to collect and preserve objects of scientific and artistic value, representing past and present fauna and flora, the life and works of man, geological history, natural resources, and the manufacturing and fine arts;

To supply natural history specimens to the state educational institutions and to the public schools;

To investigate the entomology of the state;

To investigate all insects dangerous or injurious to agricultural or horticultural plants and crops, live stock, to nursery trees and plants, to the products of the truck farm and vegetable garden, to shade trees and other ornamental vegetation of cities and villages, to the products of the mills and the contents of warehouses, and all insects injurious or dangerous to the public health;

To conduct experiments with methods for the prevention, arrest, abatement and control of insects injurious to persons or property;

To instruct the people, by lecture, demonstration or bulletin, in the best methods of preserving and protecting their property and health against injuries by insects;

To publish, from time to time, articles on the injurious and beneficial insects of the state;

To study the geological formation of the state with reference to its resources of coal, ores, clays, building stones, cement, materials suitable for use in the construction of roads, gas, mineral and artesian water and other products;

To publish, from time to time, topographical, geological and other maps to illustrate the resources of the state;

To publish, from time to time, bulletins giving a general and detailed description of the geological and mineral resources of the state;

To cooperate with the United States Geological Survey in the preparation and completion of a contour topographical survey and map;

To collect facts and data concerning the water resources of the state;

To determine standards of purity of drinking water for the various sections of the state;

To publish, from time to time, the results of its investigations of the waters of the state to the end that the available water resources of the state may be better known and that the welfare of the people in the various communities may be conserved;

To make analyses of samples of water from municipal or private sources;

To distribute, in its discretion, to the various educational institutions of the state specimens, samples and materials collected by it after the same have served the purposes of the department.

LICENSING OF PROFESSIONS

The department of registration and education shall, wherever the several laws regulating professions, trades and occupations which are devolved upon the department for administration so require, exercise, in its name, but subject to the provisions of this act, the following powers:

Conduct examinations to ascertain the qualifications and fitness of applicants to exercise the profession, trade or occupation for which an examination is held; and pass upon the qualifications of applicants for reciprocal licenses, certificates and authorities;

Prescribe rules and regulations for a fair and wholly impartial method of examination of candidates to exercise the respective professions, trades or occupations;

Prescribe rules and regulations defining, for the respective professions, trades and occupations what shall constitute a school, college or university, or department of a university, or other institutions, reputable and in good standing and to determine the reputability and good standing of a school, college or university, or department of a university, or other institution, reputable and in good standing by reference to a compliance with such rules and regulations;

Adopt rules providing for and establishing a uniform and reasonable standard of maintenance, instruction and training to be observed by all schools for nurses which are to be deemed reputable and in good standing and to determine the reputability and good standing of such schools for nurses by reference to compliance with such rules and regulations;

Establish a standard of preliminary education deemed requisite to admission to a school, college or university, and to require satisfactory proof of the enforcement of such standard by schools, colleges and universities;

Conduct hearings on proceedings to revoke or refuse renewal of licenses, certificates or authorities of persons exercising the respective professions, trades or occupations, and to revoke or refuse to renew such licenses, certificates or authorities;

Formulate rules and regulations which require in any act to be administered.

None of the above enumerated functions and duties shall be exercised by the department of registration and education, except upon the action and report in writing of persons designated from time to time by the director of registration and education to take such action and to make such report, for the respective professions, trades and occupations as follows:

For the medical practitioners, embalmers and midwives, five persons, all of whom shall be reputable physicians licensed to practice medicine and surgery in this state, no one of whom shall be an officer, trustee, instructor or stockholder or otherwise interested directly or indirectly, in any medical college or medical institution. For the purpose of preparing questions and rating papers on practice peculiar to any school, graduates of which may be candidates for registration or license, the director may designate additional examiners whenever occasion may require;

For the pharmacists, five persons, each of whom shall be a competent registered pharmacist, in the state, and shall have had ten years' practical experience in the dispensing of physicians' prescriptions since such registration;

For the dentists, five persons, each of whom has been a licensed practitioner of dentistry or dental surgery in this state for a period of five years or more, and no one of whom is in any way connected with or interested in any dental college or dental department of any institution of learning;

For the registered nurses, five persons, each of whom is a registered nurse in this state and has been graduated for at least a period of five years from a school for nurses in good standing, and, during the course of training, has served for two years in a general hospital, and three of whom shall have had at least two years' experience in education work among nurses;

For the optometrists, five persons from among such practicing optometrists of the state as have had not less than five years' practical experience in optometry, no one of whom is a member of any optical school or college or instructor in optometry or person connected in any way therewith, or is a manufacturer, jobber or jobbing representative;

The action or report in writing of a majority of the persons designated for any given trade, occupation or profession, shall be sufficient authority upon which the director of registration and education may act.

In making the designation of persons to act for the several professions, trades and occupations, the director shall give due consideration to recommendations by members of the respective professions, trades and occupations and by organizations therein.

Whenever the director is satisfied that substantial justice has not been done either in an examination or in the revocation of or refusal to renew a license, certificate or authority, he may order reexaminations or rehearings by the same or other examiners.

All certificates, licenses and authorities shall be issued by the department of registration and education, in the name of such department, with the seal thereof attached.

Medicolegal

Removal of Public Officers by State Board of Health

(State ex rel. Attorney General vs. McDowell (Miss.), 71 So. R. 867; also Ware vs. State ex rel. Poole (Miss.), 71 So. R. 868)

The Supreme Court of Mississippi, Division B, says that the question to be determined in the first or McDowell case was whether or not, under a statute giving the state board of health authority to remove the state factory inspector "for cause," the board has the authority to remove such officer without specifying any cause satisfactory or otherwise and to remove him without a hearing. In the court's opinion, the authority conferred on the board of health to remove the factory inspector can be exercised only on "charges, notice and an opportunity to be heard." While the board of health under the statute in question has the authority to remove the factory inspector for cause, this cause must be a good cause, and not a mere arbitrary exercise of the authority thus conferred. The factory inspector must be informed of the nature of the charges preferred against him, and an opportunity must be afforded him to be heard; in other words, he is entitled to his day in court.

The same court says, in the second or Poole case, which involved the question of the power of the state board of health to remove a county health officer, that the case was ruled by the principle announced in the McDowell case, which was argued and submitted rather as a companion case. The position of county health officer is one provided by the legislature many years ago, and the incumbent is beyond question a servant of the public, and responsible to the people of his county for the manner in which he discharges the large and important duties imposed on him by statute. Matters affecting the public health and quarantine are intrusted to him. The statute contemplates that if he is faithful to the trust imposed, he will serve at least a term of two years, and it is to be noted that his salary is fixed by the year. The legislature never contemplated or intended that the state board of health should have or exercise the power of removal "at any meeting" without reason, notice or hearing. The proper construction of the statute simply means that the state board may exercise the power of removal for good or reasonable cause. What is or is not reasonable cause may well be a matter largely within the discretion of the board, but certain it is that the legislature never intended that one of our public officers should be thrust out of office without any reason whatever. This interpretation of the statute does no violence to the language employed by the legislature. If this is not the meaning of that section giving the board the right to remove, then the other provision of the statute fixing the term of office at two years would mean nothing.

Not Bound by Diagnosis of Physician

(Southern Woodmen vs. Davis (Ark.), 187 S. W. R. 638)

The Supreme Court of Arkansas, in affirming a judgment in favor of Plaintiff Davis for $1,700 for alleged total disability, says the proof in the blanks filled out tended to show a total and permanent disability, while the ailment disclosed in the examination of the physician was shown in the affidavit of the physician to be tuberculosis. The society caused an examination to be made by another physician, who failed to find any indications of the disease named, and refused payment, whereupon this suit was commenced to recover the amount. The proof adduced by the plaintiff tended to show, not a case of tuberculosis, but of interstitial nephritis or Bright's disease. The evidence was sufficient to establish the fact that the plaintiff was incurably afflicted with that disease, and that he was totally and permanently incapacitated from any kind of manual labor such as was necessary to carry on his business of farming or logging. The defendant contended that he was not entitled to recover because he did not furnish satisfactory proof of loss. The contention was that his case must fail because he sent in proof of disability on account of tuberculosis, and that he subsequently abandoned that and undertook to prove that he was suffering from another disease which caused his alleged total disability. But the court does not think there was any merit in the defendant's contention, for it simply came down to the point whether or not the plaintiff was bound by the diagnosis of the physician as to the cause of his disability. He furnished proof on blank forms prescribed by the home office of the defendant society, and those proofs tended to show that he was permanently and totally disabled, and his right to recover was not defeated because there was an error made by the physician in the diagnosis of his case.

Society Proceedings

COMING MEETINGS

Alabama State Medical Association, Montgomery, April 17-20.
Am. Assn. of Pathologists and Bacteriologists, New York, April 6-7.
American Gastro-Enterological Assn., Atlantic City, April 30-May 1.
American Urological Association, Chicago, April 2-4.
Arizona Medical Association, Douglas, April 17-18.
Arkansas Medical Society, Little Rock, May 1-3.
California State Medical Society, San Diego, April 17-19.
Georgia Medical Association, Augusta, April 18-20.
Illinois State Medical Society, Bloomington, May 8-10.
Iowa State Medical Society, Des Moines, May 9-11.
Kansas Medical Society, Salina, May 2-4.
Louisiana State Medical Society, Alexandria, April 17-19.
Maryland Medical and Chirurgical Faculty, Baltimore, April 24-26.
Mississippi State Medical Association, Jackson, May 8-9.
Missouri Valley Medical Society, Keokuk, Ia., March 22-23.
Nebraska State Medical Association, Lincoln, May 8-10.
New York State Medical Society, Utica, April 24-26.
North Carolina State Medical Society, Asheville, April 17.
Oklahoma State Medical Assn., Lawton-Medicine Park, May 8-10.
South Carolina Medical Association, Spartanburg, April 17-19.
Tennessee State Medical Association, Nashville, April 3-5.
Texas State Medical Association, Dallas, May 8-10.

THE THIRTEENTH ANNUAL CONFERENCE OF THE COUNCIL ON HEALTH AND PUBLIC INSTRUCTION OF THE AMERICAN MEDICAL ASSOCIATION

Held in Chicago, Feb. 6, 1917

DR. HENRY M. BRACKEN, St. Paul, in the Chair

Public Health Training in Universities

DR. GEORGE E. VINCENT, President-Elect, Rockefeller Foundation: Successful public health training must be carried on either by universities or by schools in close affiliation with them. This is not to say that the university can provide all of the necessary conditions. The closest and most sympathetic cooperation with agencies which are carrying on actual public health activities is of fundamental importance. All the schools provide for practical field work. The need of connecting the experience in the laboratory and the material of the lecture room with the actual concrete problems of the profession is universally recognized.

A few phases of public health work seem either to have been overlooked or only incidentally recognized. For example, the function of public health education and publicity is one which deserves study and for which special types of training should be provided. The education of public opinion in a democratic country is necessary for the progress and stability of public health work. In an attempt to outline the chief lines of future development, it may be well to enumerate the different types of public health functionaries for whom train-

ing will have to be provided. These fall into a number of fairly well defined groups: 1. Public health administrators; men with fundamental and thorough training who are capable of serving as federal functionaries, and as state, city and county health officers. 2. Laboratory men who have had sufficient contact with field work to be thoroughly intelligent about their duties. In this group may be included also statisticians whose training in public health enables them to interpret with some intelligence the data with which they deal, and to estimate with reasonable accuracy the coefficient of corruption and the mean of mendacity by which vital statistics are so largely vitiated. 3. Administrative specialists who, with a background of general training, have become proficient as epidemiologists, authorities in tuberculosis, or specialists in venereal diseases. 4. Sanitary engineers who deal with engineering problems not merely from a physical but from a biologic point of view. 5. School medical officers who are more than practitioners and see the health of the school in its wide relations to community life on the one hand and to individual efficiency on the other. 6. Specialists in public health education and publicity who combine with accurate knowledge the capacity to apply practically the principles of individual and group psychology. 7. Public health nurses with special training and aptitude for the important duties which more and more will devolve on them. These nurses will be differentiated, for example, into the city nurse, the town nurse and the rural nurse. 8. Sanitary inspectors of many kinds, the artisans of the public health service, who nevertheless require a training which will enable them to do their work intelligently and with satisfaction both to themselves and to the community.

In order to insure this unified, purposeful kind of organization, the agency for teaching public health must have reasonable autonomy. It will not do to make the new curriculum a mere by-product of medical education or subject to its sole control. There should be a special administrative board and a director imbued with the ideals of preventive medicine. Only under such conditions can a public health teaching organization gain the requisite authority, coordinated efficiency and professional spirit. The outlook for public health in the United States is encouraging. There is an increasing recognition of its economic and social importance as well as its bearing on individual happiness.

Public Health Instruction in Medical Schools

DR. M. J. ROSENAU, Boston: We must keep clearly before us that the purpose of teaching public health in medical schools is not to make health officers of medical students, but to broaden their training so as to fit them better for the practice of medicine. Special training for a public health career requires special courses and even special schools. The importance of training health officers deserves the recognition which it is getting. The teaching of hygiene may then be used as one of the means to broaden the point of view of the medical school and to widen the horizon of the medical student. The medical profession is one of the most important links in the sanitary chain. The efficiency of any system of health administration depends on the cooperation of a trained group of skilled physicians, acting independently and collectively. No medical school can ever be complete enough to offer facilities to cover the entire field of public health instruction. Cooperation must be established with federal, state and city health departments, and with many philanthropic and semipublic agencies. Milk stations, baby welfare work, antituberculosis societies, psychopathic clinics, institutions for the feebleminded, water and sewage boards, hospitals for contagious diseases, board of health laboratories, quarantine stations, medical inspection of schools, and many other agencies may be utilized with advantage in teaching the subject.

DISCUSSION ON THE PAPERS OF PRESIDENT VINCENT AND DR. ROSENAU

DR. VICTOR C. VAUGHAN, Ann Arbor, Mich.: Medicine consists of that knowledge which can be utilized in the prevention or cure of disease. Hygiene consists of that knowledge which can be used in the prevention of disease. No one can teach medicine without teaching hygiene. No student can read a textbook on any infectious disease without getting some knowledge of its prevention, so that the teaching of preventive medicine necessarily goes with that of curative medicine. The clinical teacher must discuss antitoxin; he must discuss the diphtheria bacillus, how the disease is spread, how it is prevented. This is true of other infectious diseases. In discussing smallpox and typhoid fever he must bring out the principles of vaccination, and so on. Notwithstanding the fact that preventive medicine is taught along with curative medicine, there must be a distinct and well defined course in hygiene per se. As dean of a medical school, I try to take into consideration all the subjects that must be taught in that school, and not overemphasize or magnify what I myself teach. All my students must read either Rosenau's "Preventive Medicine" or Harrington's "Hygiene." We have optional courses in water analysis, food analysis and sanitary surveys. The course in hygiene includes those things not likely to be taught from other chairs, as, personal hygiene, food, drink, clothing, exercise and mental hygiene. We then take up the hygiene of the home, ventilation, heating, the hygiene of the community, municipal hygiene, rural hygiene, state hygiene and national hygiene. In studying hygiene we study the law, the public acts of various cities in Michigan especially, although I encourage students to make a special study of the acts of the state in which they live or intend to practice. No better or more efficient course in hygiene can be given than would be secured by universal military training.

DR. C. E. CANTRELL, Greenville, Texas: The people of this country, outside of large cities, have not men qualified to do this work. The universities must do graduate teaching.

DR. H. B. HEMENWAY, Evanston, Ill.: Malcolm Watson says that a sanitarian has to approach the subject through medical practice, a handicap which very few men have ever been able to overcome. The medical profession has been the greatest stumbling block to sanitary progress in the past. For the trained specialist a school should be entirely independent. There is a great difference between the work of the public sanitarian and that of the medical profession. One of the great weaknesses in our administration has been ignorance of law.

DR. M. F. BOYD, Iowa City, Iowa: Those engaged professionally in public health work look forward to the time when the public health administration of this country will be in the hands of professionally trained sanitarians, even though the most optimistic of us will admit that that time is far off. Who is going to supervise the health of the people in the meantime? The medical profession. No profession is so well qualified to handle public health work under present circumstances. If our medical schools would devote more attention to this subject, an immense improvement would result. The men who are destined at some time in their practice to serve as local health officers would understand their duties. That is perhaps the best solution of the problem until the advent of whole time health officers professionally trained as such. The American Public Health Association, realizing the difficulties which exist at present, at the Cincinnati meeting of 1916 passed a resolution creating a permanent committee on public health education. One of the duties of the committee is to endeavor, in the course of years, to increase the amount of time and attention paid to the subject in medical schools. To that end they directed that the committee cooperate with the Council on Health and Public Instruction and the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges, and to this end, as representatives of this body, I would urge that these councils of the American Medical Association appoint representatives to cooperate with the Committee on Public Health Education of the American Public Health Association.

DR. A. W. ABBOTT, Philadelphia: Dr. Rosenau asked in his questionnaire whether I regarded the number of hours allotted to me at the university for teaching hygiene sufficient? I replied that I did. I am opposed to increasing the complexities of our medical curriculum. That of the University of Pennsylvania differs little from that of other good schools.

They all want remodeling. Hygiene is too big a subject to be taught in toto in any course except a special course in hygiene. As a part of the medical course, the most that one can aspire to do is to give the candidate for a medical degree a review of the problems which have been accomplished.

DR. JOHN M. DODSON, Chicago: We may before long have to go farther than Dr. Abbott has indicated and specifically educate young men for family health officers. Medicine is becoming so specialized that the function of the general practitioner is gradually disappearing, even in the smaller towns. The conscientious practitioner long ago recognized the importance of referring difficult surgical cases—everything except emergency surgical cases—to some special man. What applies to all recognized special lines is becoming equally true of general medicine, that adequate modern care cannot be given to the man ill with acute disease except by men with special facilities and special training, and that leaves the general practitioner with not very much to do. Large industrial organizations, and other types of organizations, are looking to the purely preventive side of the health of their employees, and we may find it necessary to direct our education along different lines, giving students instruction in hygiene and preventive medicine.

PROF. E. O. JORDAN, Chicago: The provision for the teaching of hygiene in our medical schools has not only for a long time been inadequate, but is at present lamentably so. Outside of the handful of schools that Dr. Rosenau mentioned, very little provision is made for the teaching of hygiene in our medical schools throughout the United States. We are talking now about introducing a course in military hygiene and sanitation into our medical schools. The first step is to provide in every medical school for a full time man on this subject. That could have been done at any time in the last ten years. We find ourselves now lacking any number of medical men trained in hygiene. One of the speakers has pointed out that for a long time to come we shall have to depend on graduates in medicine for the supervision and control of much of our public health work. These men should receive an adequate outline of training in hygiene.

DR. VICTOR G. HEISER, New York: During the past fifteen years I have had working with me graduates from medical schools of the United States, and their woful deficiencies in matters of hygiene and sanitation have been harder to overcome than the apathy of the public with which we have to deal. I am pleased to see that there has been a recognition of the necessity of improving instruction in these lines. During the past few years I have had occasion to visit most of the medical schools in the eastern hemisphere, particularly those of India. Hygiene and sanitation, and much of medicine is far better taught in the average school in India than it is taught in the United States. The facilities and equipment and the ability of the teachers themselves far exceed the average in this country.

The State Regulation of the Practice of Medicine as an Executive Problem

HON. JAMES M. COX, Governor of Ohio: Every important calling has to be regulated, and the logical arrangement is regulation by government because the individual citizenship has neither the time nor the agency to work out this regulation. The motive of the medical profession is to conserve the public health. When you establish the motive of the other fellow, you have accomplished nine tenths of the task of analysis.

I know of no physician who ever entered the medical profession prompted by a lust for a million dollars. If he did, he probably did not remain in it long. There is no profession that is making more progress than the medical fraternity, and certainly none that is rendering a greater service to humanity. Members of your profession are apt to get restive because of the difficulties that you encounter in your affairs with the cults, so called. You must remember, and if any of you have had public experience you will know the force of my contention, that we can work things out in this country only by the processes that are given to us by democracy in government. You know in your own minds full well just what sort of statutory provision would best conserve public health, and yet if you were arbitrarily to put it into effect now you might delay your ultimate accomplishment many years. Now, I speak from experience because I was the governor of the state of Ohio, if you will permit a personal reference, immediately after the adoption of a new constitution. I have never felt it was a revoluntionary upheaval in Ohio. I always looked on it as an evolutionary upheaval in authority, and we have had fifty-six varieties of laws in Ohio. I knew they were right and we passed them, but my friends, the populace, had not caught the glimpse, and they gave me a two years' vacation.

You are not going to be enabled to stamp things out that you think are harmful today. But if your concept of things is sound, and I am rather disposed to think that it is, then you can depend first on the intelligence of public opinion, and secondly on the courageous exercise or manifestation of that public opinion. It is singular how many of our citizens in every state inveigh against a standard. It seems to me, that is your great battle. But I urge you to stand by it with all the militancy of a great profession. Do not lower the standard of your profession, regardless of the cults who oppose you.

To the state medical boards and boards of health, there should always be attached men of principle, men of courage, who get a vision of the real ideals that you men are holding to, and then you have the courage not to depart from those ideals. My observation in Ohio has been that in Dr. Matson, for instance, laws are all safe because I have found that the governor of the state can be looked squarely in the eye by Dr. Matson, and if he does not agree with the executive thought he firmly but respectfully says so. Now, I speak of him as a type. Of course, we feel that all things are a little bit better in Ohio, and the nearest approach you make to Ohio standards and ideals, the better.

While the governor has the right of saying what the state medical board does in Ohio, I have never run counter to the recommendation of the medical board. I know that the members of the medical board are devoted to high ideals, and so far as I can give them cooperation and help to maintain those ideals, I shall do it.

I do not know what your experience is in other states, but in the state of Ohio the time has come, and I assume the situation is very much the same with you, for a more rigid supervision of health matters in the rural counties. It is only by the grace of God that half of the population have not died from typhoid fever in communities in which they have open wells and insanitary situations. In Knox County they had a widespread epidemic of typhoid fever. No one was sick save those who took milk from one dairyman. That circumstance made some impression on the imagination and the understanding of that community, and now the health officer has no trouble. There are rural counties in Ohio in which there is no supervision over health matters except that exercised by the state under its police powers. Society was delinquent. We have demonstrated that by the establishment of a branch of government which is more or less new.

The probate courts and juvenile courts in our state have to do with the assignment of delinquent youths to our state institutions. We found at Lancaster, for instance, that boys mentally unsound were put in close contact with boys who were perfectly sound mentally, but who had slipped their foot in some moral way either by virtue of their home association, or of their not having a home worth while. We have changed the law to provide that instead of the probate judge sending these delinquent youths to the institution at Lancaster, to the institution at Delaware or to some other institution, they are sent to the board of administration at Columbus, and are held in surveillance under inspection as long as necessary by the board of administration. How did it work out? They found an ever-ceasing stream of boys and girls with poor eyesight, some of them mentally delinquent, some of them not; some of them suffering from enlarged tonsils, and still others suffering from profound anemia. The board of administration through this newly created department built up these boys, and it was amazing how the crop improved.

Those youngsters were simply plants of humanity that had been reared low in the valley, probably under the stones, and they gained their first glimpses of those elements of nature which are so essential to life itself, and we found that in from thirty to sixty days we changed the whole aspect of things. We found some children, for instance, 10 and 15 years of age who had the mental equipment of children of 5 or 6 years of age. We resorted to the Binet test; then we established the placing out process, finding homes for these children so that they might grow into useful citizens. We found homes for them because there are thousands of homes without children as there are thousands of homeless children. Then we kept our eye on both these children and those homes, making sure, in the first place, the children were making progress, and, in the second instance, that the homes were satisfactory places for the children.

I believe that you should require a physician to have a four year course in a high school, a two year course in a university or college of arts and sciences, a four year course in a reputable medical school, and at least a year's experience in some hospital. We have no fear in our state as to the efficiency of physicians, if that standard is to be maintained. Probably the rapid development of what we designate as cults is due in some instances to the standards that have been established. I will urge on you, for the time being at least, a common sense mental attitude toward the cults, so called, basing that observation on the thought that if they are not going to make a useful contribution to society, then their failure will, in more or less quick time, be recognized by society, and society will help stamp it out.

DISCUSSION

DR. THOMPSON, President, University of Ohio, Columbus: We all believe in the fundamental principles of education. Americans believe that education is a panacea for all human ills if you let it work long enough. We are interested in educational administration from the standpoint of the profession. This is particularly true of universities and colleges that have professional schools. I am interested in the legislation of our states bearing on the practice of medicine. A serious problem which presents itself to the educational portion of the community is the administration of these laws. We have to deal fundamentally with the questions which underlie these professions. These questions are chiefly those of applied science. Our institution is interested in the problems with which the board of health must deal. As deans and trustees, we feel it would be well to take a friendly attitude toward any body of men interested in the application of science to human welfare. That is the attitude university presidents and university boards of regents take concerning the larger questions of medicine. The state university and the privately endowed university have for their broad outlook public welfare, and so we are interested in the administration of applied science toward public welfare. That, more than any other reason, is the one that underlies our belief that the medical college should be associated with a university.

DR. JOHN A. ROBISON, President of the Illinois State Board of Health, Chicago: In regard to cults, the Illinois law requires that a physician shall have a certain preliminary education, that he shall attend a recognized medical college, and be examined before he can receive a license to practice. The law, however, permits any individual who does not wish to practice regular medicine, but who wishes to practice it in some other form, to submit merely to an examination by the state board of health. He does not have to exhibit any preliminary education, he does not have to be a graduate of a high school or university, nor does he have to attend any particular college of his own cult for training. It is an injustice to the physician that he has to spend so many years and so much time and have to undergo examination before he receives a license to practice. But the injustice is not so much to the physician as it is an injustice to the people of the state of Illinois, in which persons can be licensed by the state to practice on them without the requisite training.

DR. DAVID A. STRICKLER, Secretary, Colorado State Board of Medical Examiners, Denver: The laws are safe in the hands of good men. A board is effective only if its members are men of good executive ability. The medical profession should insist that it be represented by men of good executive ability, and to this end should bring influence to bear on those who make the appointments. The public does not have confidence in the purposes of the medical profession that it should have. If a jury is under the impression that the state board of medical examiners is back of a prosecution, it will free the individual in a large percentage of cases, no matter what the evidence against him is with relation to practicing medicine. If it be a question between an ethical physician and an unethical physician, the jury will give the advantage to the unethical physician every time. If it be a question between a layman and ethical physician or an unethical physician, the jury will give the advantage to the layman every time. I speak of this as a practical point in the administration of laws, and I believe it is true in every state. I know it is true in Colorado.

Current Medical Literature

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

March, LXXV, No. 3

1 Conservation of Energy in Spinal Anesthesia; Its Value in Weakness of Cardiac Muscle. R. R. Huggins and B. Z. Casleman, Pittsburgh.—p. 353.
2 Organotherapy in Gynecology; Report of Cases. F. B. Block and T. H. Llewellyn, Philadelphia.—p. 357.
3 Relation of Glands of Internal Secretion to Female Pelvic Organs. C. W. Vest, Baltimore.—p. 366.
4 *End Results of Cesarean Section. O. P. Humpstone, Brooklyn. —p. 372.
5 Gynecologic Postoperative Treatment at Long Island College Hospital. C. R. Hyde, Brooklyn.—p. 378.
6 Case of Adenomyoma of Rectovaginal Septum. A. Heineberg, Philadelphia.—p. 384.
7 Imperforate Hymen; Large Serocolpos in Child. S. Wiener, New York.—p. 398.
8 Diffuse Fibromas of Ovary. P. J. Reel, Columbus, Ohio.—p. 400.
9 Cases of Myomectomy in Pregnancy. J. A. McGlinn, Philadelphia. —p. 406.
10 When to Use Curet in Infected Abortions. J. O. Polak, Brooklyn. —p. 409.
11 Treatment of Papillomatous Growths of Ovary After Pozzi Method. C. R. Hyde, Brooklyn.—p. 412.
12 *Tuberculous Glands of Mesentery; Report of Cases. A. T. Jones, Providence, R. I.—p. 417.
13 *Relation of So-Called Ether Pneumonia to Pelvic and Abdominal Surgery. W. E. Darnall, Atlantic City, N. J.—p. 426.
14 Hospital Management. G. K. Dickinson, Jersey City, N. J.—p. 434.
15 Surgeon's Responsibility to Economics of Hospital. E. Marvel, Atlantic City, N. J.—p. 439.
16 Goiter and Pregnancy. A. Crotti, Columbus, Ohio.—p. 450.
17 Postpuerperal Sterility; Its Cause and Surgical Treatment. H. S. Lott, Winston-Salem, N. C.—p. 456.
18 Strangulated Ovarian Cyst Simulating Appendicitis; Report of Cases. E. A. Vander Veer, Albany, N. Y.—p. 459.
19 Digital Rotation in Occipitoposterior Positions of Vertex. G. A. Peck, New Rochelle, N. Y.—p. 463.
20 Premature Separation of Normally Situated Placenta in Latter Months of Pregnancy. L. A. Wing, New York—p. 471.

4. End Results of Cesarean Section.—One hundred and forty-eight consecutive cases of abdominal hysterotomy were analyzed by Humpstone. Dystocia due to disproportion is by far the most frequent indication in this report, 109 cases, in three of which prolapse of the funis was also found. Dystocia from the soft parts alone led to cesarean section in several cases. Ventral fixation, intentional or accidental, was the cause for ten operations, and one case of dystocia from a Coffey plication. There was one full term pregnancy after an interposition operation, one case of vaginal stenosis and one of osteoma on the posterior surface of the lateral ramus of the pubes. Three cases of contraction ring with impending rupture of the uterus gave three live babies, from uteri foul with odorous meconium, without serious morbidity to mothers. Ovarian cysts were the causative factor in three cases. Impacted face presentation with the chin posterior and tonic uterus was three times treated in this manner. Accidental hemorrhage led to operation in two cases, one of them in

which the hemorrhage was caused by a bougie employed in an attempt to induce labor. Placenta praevia was found as an indication in only one case. Oversize and overtime children twice afforded an indication. Ten sections were done for eclampsia. The maternal mortality in this whole series was 1.357 per cent. All the babies were born alive. Humpstone believes that abdominal delivery has no greater effect than pelvic delivery on the future health of the mother.

12. **Tuberculous Glands of Mesentery.**—Nine cases, the ages of the patients varying between 5 and 50 years, are reported by Jones. He believes that tuberculous mesenteric glands often occur primary to the true tuberculous type. The bovine type is undoubtedly present in many children without producing symptoms, the glands remaining quiescent, or having a tendency to subside. It is impossible to make a correct diagnosis before operation, as a rule, unless there are palpable glands which may be felt through the abdominal wall, or by the finger in the rectum. Tuberculous mesenteric glands may be present without giving symptoms. There are two clinical types: (*a*) a slightly progressing one generally with palpable glands; (*b*) an acute fulminating type most often simulating and impossible generally to differentiate from appendicitis. Prognosis in subacute stage good without operation. In acute stage exploratory laparotomy should be done, but glands not removed unless definite indications either from adhesions, ulceration or size of mass producing pain or much obstruction. Tuberculous glands of the mesentery may not present any symptoms until breaking down begins in the glands, after which the author gets symptoms of tuberculous peritonitis, intestinal obstruction, or symptoms simulating acute appendicitis. In children and young adults with history of right-sided abdominal pain, with or without palpable masses, inflamed mesenteric glands should always be considered as a possibility.

13. Abstracted in THE JOURNAL, Oct. 28, 1916, p. 1325.

American Journal of Roentgenology, New York

February, IV, No. 2

21 Bucky Diaphragm Adapted to Fluoroscopy. H. E. Potter, Chicago. —p. 47.
22 Nature and Origin of Secondary Radiation. J. S. Shearer, Ithaca. —p. 50.
23 Physical Investigation Work in Progress on Tubes and Accessories. W. D. Coolidge, Schenectady.—p. 56.
24 New Developing Formula for Roentgen Ray Plates. V. Aagaard, Battle Creek, Mich.—p. 66.
25 *Pathologic Reasons for Legitimate Error in Roentgen Ray Diagnosis of Gastric Carcinoma and Ulcer. W. C. MacCarty, Rochester, Minn.—p. 67.
26 *Syphilis of Stomach. L. T. Le Wald, New York.—p. 76.
27 *Indications for Surgical Intervention in Gastric Cancer. L. G. Cole, New York.—p. 81.

25, 26 and 27. Abstracted in THE JOURNAL, Nov. 11, 1916, p. 1470.

Arkansas Medical Society Journal, Little Rock

February, XIII, No. 9

28 Metastatic Arthritis. A. G. Lee, Texarkana.—p. 179.
29 Experiences in Cataract Extraction. H. Moulton, Fort Smith.—p. 185.
30 Peritonitis. C. S. Holt, Fort Smith.—p. 189.

Boston Medical and Surgical Journal

February 22, CLXXVI, No. 8

31 Hypertrophic Ileocecal Tuberculosis; Report of Cases. H. Gage and E. L. Hunt, Worcester.—p. 259.
32 Right Colectomy; End Results of Twelve Cases. P. P. Johnson, Beverly.—p. 266.
33 Advantages of Conservative Surgery in Operations for Diverticulitis of Descending and Pelvic Colon. J. W. Keefe, Providence, R. I. —p. 271.
34 Resection of Descending Colon and Rectum. F. H. Lahey, Boston. —p. 275.

Georgia Medical Association Journal, Augusta

February, VI, No. 10

35 Surgical Treatment of Dyspepsia. C. W. Roberts, Atlanta.—p. 195.
36 Treatment of Bronchial Asthma with Autogenous Vaccines. C. W. Findley, Broxton.—p. 198.
37 Salvarsan in Treatment of Syphilis. C. Swanson, Atlanta.—p. 201.
38 Plea for Fuller Recognition of Importance of Psychical Disorders in Medical Practice. W. W. Young, Atlanta.—p. 204.
39 Probable Case of Ovarian Pregnancy. J. I. Garrard, Milledgeville. —p. 206.
40 Comparative Study of Two Cases of Tubal Pregnancy Terminating in Rupture. E. M. Stokes, Moultrie.—p. 208.
41 Hernia. A. D. Little, Thomasville.—p. 209.

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42 Case of Acnitis in Negro. F. C. Knowles, Philadelphia.—p. 61.
43 So-Called White Spot Disease or Sclerodermia Circumscripta. F. Wise and I. Rosen, New York.—p. 66.
44 *Treatment of Acne. R. A. McDonnell, New Haven, Conn. —p. 90.
45 Sclerodactylia with Calcareous Concretions; Report of Case. G. M. Olson, Minneapolis.—p. 96.
46 Pigmented Stripe in Thumb Nail. D. W. Montgomery, San Francisco.—p. 99.

44. **Treatment of Acne.**—That vaccination has run riot in the treatment of acne is McDonnell's opinion. The real cause of acne, he is convinced, is intestinal fermentation. Therefore regulation of the diet is the most important step in the management of acne. The following should never be eaten: breakfast cereals, potatoes, fresh bread, macaroni, apples, bananas and nuts. Everything sweet should be prohibited, including candy, preserves, cake, pie, ice cream, soda water. For two weeks the patient is limited to milk toast, soft boiled eggs, dry toast and soup. After that, the diet list may include soups, fish, meats, vegetables (except potatoes and beans), fruits (except bananas and apples), eggs, toast, salads, tea, coffee and milk. At the beginning of treatment it is highly desirable to have the teeth overhauled by a competent man, and made capable of mastication. Next, the importance of chewing should be drilled into the patient. There are some drugs which are capable, to a limited extent, of holding intestinal fermentation in check. In McDonnell's opinion the best of these is ichthyol. A common prescription with him is, aloin, 0.10, ichthyol, 10.00, a sufficient quantity of licorice powder, to be mixed and divided into thirty capsules, of which one is to be taken after each meal. Other drugs will readily suggest themselves.

Journal of Immunology, Baltimore

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47 *Disappearance of Agglutinin from Blood of Anaphylactic and Normal Animals. H. Hempl, Copenhagen.—p. 141.
48 *Specific and Nonspecific Action of Rabbit Blood Serum in Complement Fixation Test. I. F. Huddleson, Ann Arbor, Mich. —p. 147.
49 *Analysis of Anaphylactic and Immune Reactions by Means of Isolated Guinea-Pig Lungs. W. H. Manwaring and Y. Kusama, San Francisco.—p. 157.
50 *Bacteriolytic Power of Normal and Immune Rabbit Serum for Typhoid Bacilli and Influence of Intravenous Injection of Vaccine on Same. O. Teague and H. I. McWilliams, New York.—p. 167.
51 *Experiments with Possible Bearing on Treatment of Typhoid with Typhoid Vaccine Administered Intravenously. O. Teague and H. I. McWilliams, Rosebank, N. Y.—p. 185.
52 *Bacteriolytic Power of Normal Human Serums and Typhoid Patients' Serum for Typhoid Bacilli and an Inquiry into Theoretical Basis for Treatment of Typhoid with Vaccine Administered Intravenously. O. Teague and H. I. McWilliams, Rosebank, N. Y.—p. 193.
53 *Hay-Fever. Nature of Process and of Mechanism of Alleviating Effect of Specific Treatment. R. A. Cooke. E. P. Flood and A. F. Coca, New York.—p. 217.

47. **Disappearance of Agglutinin from Blood.**—To eliminate the question of absorption and to limit the problem to the destruction of agglutinin in a heterologous serum in animals sensitized to that serum, and in normal animals, Hempl made intracardiac, and, in two cases, intravenous injections of an agglutinin so strong that it could be detected in minute quantities. Guinea-pigs sensitized with a very small dose of serum were selected as the experimental animals. Hempl says that individual variation in reaction is so great that experiments in this line of work require statistical control and must be carried out with large numbers of animals to give definite conclusions. In general a foreign serum disappears more quickly from the blood of an animal sensitized to that serum than from that of a normal animal. It disappears more quickly from the blood of highly reacting animals than from that of slightly reacting animals. These experiments corroborate those of Römer and Viereck.

48. **Specific Action of Rabbit Blood Serum.**—The purpose of Huddleson's investigation was to determine whether rabbits would become infected and show *Bact. abortus* antibodies in their blood as a result of ingesting milk reacting positively to the agglutination and complement fixation tests. The results were negative. There is not sufficient evidence to condemn naturally infected milk as dangerous to rabbits by ingestion since it has shown no pathogenic action and no antigenic action. However, a nonspecific absorption of complement takes place in the presence of inactivated rabbit blood serum and a bacterial antigen of *Bact. abortus.*

49. **Analysis of Anaphylactic and Immune Reactions of Isolated Guinea-Pig Lungs.**—The authors' analyses of the anaphylactic and immune reactions by means of perfusion experiments with the isolated guinea-pig lungs show that three essential factors are to be considered: (*a*) cellular hypersensitiveness, or the anaphylactic response of the hypersensitive fixed pulmonary tissues; (*b*) humoral anaphylaxis, or the chemical response (anaphylatoxin formation) of the anaphylactic blood, and (*c*) humoral immunity, or the inhibiting or protecting action of the immune blood. In the 14-day anaphylactic guinea-pig, the fatal bronchial spasm is due, in part to fixed cellular hypersensitiveness, in part to humoral anaphylaxis. In the 4-week anaphylactic guinea-pig, the fixed cellular hypersensitiveness is usually greater than that of the 14-day anaphylactic guinea-pig. The humoral reaction, however, is usually absent. The fatal bronchial spasm in the 4-week anaphylactic guinea-pig is usually due solely to fixed cellular hypersensitiveness. The immune guinea-pig usually shows a fixed cellular hypersensitiveness greater than that of the 14-day anaphylactic guinea-pig. A fatal bronchial spasm is prevented in the immune guinea-pig, however, by the inhibiting or protecting action of the immune blood. The immune guinea-pig, therefore, shows a seemingly paradoxical phenomenon, the coexistence of a fixed cellular hypersensitiveness and a humoral immunity.

50. **Bacteriolytic Power of Rabbit Serum for Typhoid.**—The work of Buxton and others showing that normal rabbit serum is capable of killing large numbers of typhoid and paratyphoid bacilli, and that the serums of rabbits highly immunized against typhoid and paratyphoid bacilli do not kill these organisms, is confirmed by Teague and McWilliams; it is emphasized, therefore, that the titer of an immune serum as determined by the usual dilution method, with the addition of complement, is not an indication of the bactericidal power of the blood plasma in vivo. The bacteriolytic power of normal and highly immune antityphoid rabbit serum for typhoid bacilli is neither increased nor decreased by the intravenous injection of a large dose of typhoid bacilli; the serum of a rabbit that has received only one or two immunizing injections shows a distinct, but not a great, increase in its bactericidal power at five and twenty-four-hour intervals after such an injection.

51. **Typhoid Vaccine Administered Intravenously.**—The experiments reported on by Teague and McWilliams were planned to determine whether a rabbit that had received a dose of typhoid vaccine twenty-four hours previously was more resistant to a large dose of typhoid bacilli than a normal control rabbit. The result was confirmative. Therefore the authors point out a possible relationship between the phenomenon and the cure of typhoid by means of the intravenous injection of typhoid vaccine, without attempting to set up any hypothesis as to the mechanism of the process.

52. **Bacteriolytic Power of Normal Human Serums.**—The authors believe that typhoid is a local disease and not a septicemia; therefore the curative process must take place at the site of the local lesions. In almost all cases of typhoid the serum is strongly bacteriolytic for typhoid bacilli throughout the disease; it would seem that the bacteria multiply in certain tissues because the tissue fluid or lymph does not possess this property. If the intravenous injection of vaccine should cause a more active passage of bacteriolytic substances from the blood capillaries into the lymph, the destruction of the typhoid bacilli and healing of the local lesions should be effected. This is the hypothesis the authors suggest.

53. **Hay-Fever.**—The available facts, clinical and experimental, relating to hay-fever form the basis of the authors' conception of that and all other forms of natural human sensitization: (1) Hay-fever is the clinical symptomatic expression of local hypersensitiveness. The active pollen substances are not toxins; (2) the hypersensitiveness is established spontaneously and never by immunologic process. This has been shown in two ways; first, by the observation that individuals may be sensitive to pollens of plants that are indigenous in foreign countries and with which they have never come in contact; and second, by the observation that individuals who are naturally sensitive to one protein only cannot be artificially sensitized to another protein, either animal or vegetable; (3) the sensitization is not directly inherited, although the tendency to spontaneous sensitization is inherited as a dominant character; (4) the antibody-like substances of human sensitization are not demonstrable in the blood of sensitive persons by any of the immunity reactions. They are present in the cells of the sensitive tissues. They cannot be increased artificially by the usual process of immunization; (5) the mechanism of the alleviating effect of specific, that is, vaccine therapy, is the same as that of desensitization in experimental anaphylaxis. The freedom from symptoms lasts as long as the respective "antigenic" substances remain in combination with the antibody-like substances in the tissues.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

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54 *Salicylates. V. Excretion of Salicyl in Urines of Rheumatic and Nonrheumatic Individuals. P. J. Hanzlik, R. W. Scott and T. W. Thoburn, Cleveland.—p. 247.

55 *Fate of Iodin, Iodids and Iodates in the Body. T. Sollmann, Cleveland.—p. 269.

54. **Excretion of Salicyl in Urine.**—The object of this contribution is to compare the quantitative excretion of salicyl in rheumatic and nonrheumatic, or practically normal, subjects. This was intended to show whether the therapeutic effects of salicylate could be based on differences in the retention or "affinity" of the normal and rheumatic organism for salicyl. The total excretion of salicyl is about 15 per cent. less in rheumatic than normal individuals. This difference is greatest in the early periods after the administration of the drug; that is, during the first ten to twenty hours. The concentration of salicyl in the blood of rheumatic individuals at "toxicity" is less, and the concentration in the urine at this time is also less than in normal individuals. These differences are not due to diuresis; nor to retention and vicarious excretion of the salicyl. They seem to be due to an increased destruction of the salicyl in the febrile rheumatic organism. A lessened excretion of salicyl was demonstrated in a number of individuals representing such conditions as chronic alcoholism and morphinism, tuberculosis and diminished renal functional efficiency as compared with normal individuals. The administration of sodium bicarbonate together with the salicylate has practically no effect on the excretion of salicyl in the urine, or its "toxic" effects.

55. **Fate of Iodin in the Body.**—An investigation was planned by Sollmann to determine (1) whether the administration of elementary iodin can result in the appearance of iodid and iodate in the blood or tissues; and (2), whether elementary iodin can be liberated from iodid and iodate, combined or separately, with the reaction (hydrogen ion concentration) that is known to exist in the body. He found that large doses of free iodin, administered by the stomach, exist in the blood solely as iodid. The addition of acid to the blood does not regenerate iodin. No iodin is liberated from iodid-iodate or iodid-nitrate or iodate-sulphocyanid mixtures, until the acidity surpasses Hp-4. It is therefore impossible that iodin should be liberated from iodid under any conditions existing in the body (excepting solely the gastric juice). On the other hand, the alkalinity of the body is not sufficient to bind any noticeable quantity of free iodin—even in the absence of proteins and aromatic groups. The questions that were proposed are therefore answered in the negative: (1) the blood, after the administration of free iodin, does not liberate

iodin on acidulation, because the iodin is bound through the protein, and not through the alkali; (2) free iodin cannot be liberated in the body, since all the conceivable reactions for the liberation of iodin from its compounds require much higher hydrogen ion concentrations than exist anywhere in the body.

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56 *Studies on Growth of Cells. Cultivation of Bladder and Prostatic Tumors Outside the Body. M. T. Burrows, J. E. Burns and Y. Suzuki, Baltimore.—p. 3.
57 *Double Ureter and Kidney, with Calculous Pyonephrosis of One Half; Cure by Resection. Embryology and Surgery of Double Ureter and Kidney. H. H. Young and E. G. Davis, Baltimore.—p. 17.
58 *Bacteriology and Microscopy of Contents of Seminal Vesicles; Postmortem Study of Fifty-Two Cases. B. A. Thomas and F. G. Harrison, Philadelphia.—p. 59.
59 Relation of Nonprotein Nitrogen to Urea Nitrogen of Blood. H. O. Mosenthal and A. Hiller, Baltimore.—p. 75.
60 *Advantages of Pyelotomy Drainage for Nephrotomy Wounds. E. L. Keyes, Jr., New York.—p. 91.
61 *Physiology of Ureter and Vas Deferens. D. I. Macht, Baltimore. —p. 97.
62 *Effect of Calcium, Water and Other Substances Given Intravenously on Blood Composition and Urine Secretion. D. M. Davis, Baltimore.—p. 113.
63 Modified Woodyatt Pump. D. M. Davis and W. S. Gorton, Baltimore.—p. 135.

56. **Cultivation of Bladder and Prostatic Tumors.**—The authors studied the cultures of twelve tumors of the bladder and the prostate. Seven were clinically malignant bladder papillomas; one, a benign bladder tumor; two benign hypertrophy of the prostate, and two prostatic tumors, each of which showed one portion of typically benign hypertrophy, the other part having undergone a carcinomatous change. Besides these, one series of cultures of normal bladder epithelium was also tested. The culture medium consisted of the patient's blood plasma, normal blood plasma, agar and isotonic sodium chlorid. Of the seven malignant bladder tumors cultivated, one only failed to show cellular activity in the first twenty hours. This tumor had been removed after the application of a strong solution of cocain. The cultures of the benign tumor, on the other hand, have shown no cellular activity either in the first or the second transplants. All of the cultures of the bladder tumors were infected with bacteria. However, previous to the time that the bacteria became very numerous the tumor cells showed activity except in two instances.

57. **Double Ureter and Kidney.**—The case reported by Young and Davis is unique in that it is the only such case to be found fully reported in the literature. The condition of double kidney and ureter is not rare, and the upper half is most often the seat of disease; its surgical importance is therefore great. The advent of ureteral catheterization, roentgenography and pyelography has made the diagnosis easy. The radical cure by excision of the diseased half of the kidney with its pelvis and ureter is undoubtedly the method of choice.

58. **Contents of Seminal Vesicles.**—A postmortem examination of the seminal vesicles of fifty-two human male cadavers was made by Thomas and Harrison. They found that the seminal vesicles harbor spermatozoa after death, and therefore presumably during life. This function is exercised in the presence of inflammation (spermatocystitis), although in a large percentage of inflammatory cases no spermatozoa can be found (postmortem). The determination of the viability of the zoosperm in the presence of seminal vesiculitis, the exact identification, classification and relative frequency of the invading bacteria, particularly with reference to gonorrhea, are questions impossible of solution by postmortem investigation, and will constitute a secondary and final report after bacteriologic and microscopic study conducted in conjunction with seminal vesiculotomy on the living subject.

60. **Drainage for Nephrotomy Wounds.**—During the past six months Keyes has opened the kidney parenchyma three times for the extraction of stone, and then deliberately inserted a probe into the kidney pelvis, and on this opened the pelvis widely, inserted a rubber tube there for drainage, and closed the parenchyma by suture. Each one of these cases has healed with the promptness characteristic of a pyelotomy; one of them with surprising promptness, for the wound became gravely infected with staphylococci from the kidney, and nevertheless all trace of urine coming from it disappeared within eight days, though the wound has been about four weeks in healing. It seems, therefore, possible, not only that pyelotomy is to be preferred to nephrotomy for extraction of stone, etc., when this is possible, but that when nephrotomy is done it may seem wiser to suture the incision in the kidney parenchyma and to drain through a counterincision made in the kidney pelvis.

61. **Physiology of Ureter and Vas Deferens.**—The behavior of the ureter and vas deferens was studied, by Macht first, on surviving excised organs, second, by observations of those organs in situ, in the living body, and third on excised human ureters and vasa deferentia after operation. He found that the isolated ureter contracts best in a slightly acid medium; the isolated vas contracts best in a slightly alkaline medium. This corresponds to the natural conditions in the body. A rise in temperature at first stimulates and subsequently paralyzes the contractions of the ureter and vas. A fall in temperature inhibits the contractions. Adequate oxygenation is essential for the maintenance of the contractions of the ureter and vas deferens in vitro. The response of the ureter and vas to epinephrin and ergotoxin is an evidence of their innervation by the dorsal lumbar or true sympathetic nervous system. The response of the ureter and vas to pilocarpin, physostigmin, muscarin, cholin and atropin is an evidence of their being also innervated by the sacral autonomic or parasympathetic nervous system. The response of the ureter and vas to nicotin points to the presence of ganglion cells in the walls of those organs.

62. **Changes in Blood Composition and Urine Secretion.**—Injections of fluid of considerable size were made intravenously by Davis in dogs, according to three methods, without producing diuresis. He suggests that in such cases definite hydremia and definite hyperglycemia may be present without diuresis. In cases in which hydremia occurs without diuresis, there has usually been a definite decrease in the molecular concentration of the plasma, as shown by the depression of the freezing point(Δ). Solutions of calcium chlorid given intravenously cause the urinary secretion to diminish, and, in addition, precipitate a great loss of water from the blood to the tissues. Given with sodium chlorid, calcium chlorid will antagonize the diuretic effect of sodium chlorid. In such a case, the general blood pressure is not changed.

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64 Question of Operation for Suspected Perforation in Typhoid. J. S. Thacher, New York.—p. 311.
65 Heredity; in Its Relation to Psychopathy and Clinical Psychology. J. V. Haberman, New York.—p. 313.
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73 Management of Corneal Injuries. F. F. Teal, Lincoln.—p. 234.
74 Value of Röentgenography in Focal Infections About Teeth. C. H. Ballard, Omaha.—p. 239.
75 Treatment of Malignant Conditions with Roentgen Ray. A. P. Overgaard, Omaha.—p. 241.
76 Resection of Duodenopyloric Region for Extensive Ulceration. H. W. Wightman, Omaha.—p. 243.

New Jersey Medical Society Journal, Orange

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84 Is Gastric Secretion Altered in Gallbladder Disease? M. G. Wohl, Omaha.—p. 347.
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95 Prevention of Infection of Cornea. L. Ostrom, Rock Island, Ill.—p. 238.
96 State Legislation Concerning Optometry. F. Allport, Chicago. —p. 247.

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99 Nephritis—Why Phenolsulphonephthalein? N. B. Edgerton, Columbia.—p. 444.
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108 Tuberculosis of Hip Joint. W. D. McVicker, Wichita, Kan.—p. 49.
109 Salvarsan in Aural Therapy. L. H. Lanier, Texarkana, Ark. —p. 52.
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113 *Indications for Cholecystectomy. F. B. Lund, Boston.—p. 275.
114 Relative Merits of Cholecystostomy and Cholecystectomy. C. H. Mayo, Rochester, Minn.—p. 281.
115 *Cholecystostomy vs. Cholecystectomy. J. B. Deaver, Pittsburgh. —p. 284.
116 *Familial Fibromyxomas of Peripheral Nerves; Report of Three Cases. L. N. Fleming and F. W. Marvin, Boston.—p. 287.
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122 Abdominal Myomectomy and Hysteromyomectomy by Morcellation. Report of Cases. C. G. Child, Jr., New York.—p. 329.
123 Sarcoma of Prostate; Report of Cases. F. J. Parmenter, Buffalo. —p. 336.
124 *Variations in Blood Supply of Ovary and Their Possible Operative Importance. J. A. Sampson, Albany, N. Y.—p. 339.
125 *Chronic Gastric and Duodenal Ulcer; Report of Cases. R. C. Coffey, Portland, Ore.—p. 350.
126 Modern Treatment of Club-Foot. R. J. Behan, Pittsburgh.—p. 356.
127 Air in Ventricles of Brain, Following Fracture of Skull. W. H. Luckett, New York.—p. 362.
128 *Compound Fracture of Skull with Loss of Nearly Half of Frontal Bone, and Parts of Left Frontal Lobe of Brain; Recovery. U. S. Kann, New York.—p. 364.
129 Telephone as Used for Localization and Removal of Metallic Foreign Bodies in Tissues. K. Bulkley, New York.—p. 366.
130 Rectal Anesthesia by Means of Ether; Report of Cases. J. B. M. y Flórez, Colombia, S. A.—p. 370.
131 *Closing Skin in Abdominal Incisions. C. S. White, Washington, D. C.—p. 373.
132 New Method of Turning Down Bone Flaps on Skull. R. E. Farr, Minneapolis.—p. 374.
133 *Simple and Efficient Preparation of Field of Operation. G. S. Foster, Manchester, N. H.—p. 375.
134 Ectopic Pregnancy Following Ligature and Section of Fallopian Tubes. J. C. Wood, Cleveland.—p. 376.

113. **Indications for Cholecystectomy.**—Lund maintains that the gallbladder should be removed under the following conditions: 1. In cases of very thick, acutely inflamed, bright red or gangrenous gallbladders due to impaction of a stone in the cystic duct. 2. In cases of chronically thickened gallbladders. 3. In cases of gallbladders very much distended with clear fluid from impaction of a stone in the cystic duct. 4. Whenever suspicion exists of malignant disease. 5. In chronic cholecystitis without stones, but with moderate thickening and ulceration of the mucous membrane, giving little yellow spots on the mucous surfaces, the so-called "strawberry gallbladder." 6. In chronic cholecystitis without stones but with adhesions to the surrounding organs, especially the pylorus, which cripple the latter and cause symptoms. 7. Cancer of the gallbladder. 8. All cases of gallstones in which the operation is not for any reason unusually difficult or dangerous. 9. All cases of cholecystitis without stones where the same conditions exist.

115. **Cholecystostomy vs. Cholecystectomy.**—Deaver's position speaking generally, is as follows: Cholecystectomy is preferable in the hands of the master of biliary surgery, since the mortality is but little higher in selected cases and the percentage of cures of the infection of the tract is greater. Cholecystostomy is slightly safer, is in many cases an eminently successful operation, and the surgeon may always reflect that two operations on a living patient are better than one on a dead one. He should remember also that prolonged drainage is the secret of sterilization of the biliary tract and by this means may convert unsuccessful cholecystectomies into successful ones. Cholecystectomy in the presence of jaundice and in the absence of a markedly and macroscopically diseased gallbladder is, in Deaver's judgment, out of place. Under these conditions cholecystostomy is the operation of choice. Jaundice in the absence of inflammation and obstruction of the common duct is most probably due to cholangitis, which calls for drainge. Drainage by way of the gallbladder is much more simply made than is drainage by the common duct. Further, the less the common duct is interfered with the better.

116. **Familial Fibromyxomas of Peripheral Nerves.**—The matter of chief interest in these three cases of multiple peripheral nerve tumors lies in the fact that they have occurred in members of the same family, a sister and two brothers. It would appear, moreover, that the tendency among the members of this family to these isolated tumors bears a definite relation to trauma. At least, in two cases the fact that a direct injury of unusual severity, occurring in the same situation, was followed in each instance by a sciatic tumor, would seem to be more than a coincidence.

124. Abstracted in The Journal, June 17, 1916, p. 2033.

125. **Chronic Gastric and Duodenal Ulcer.**—As a result of a careful study of this subject, Coffey says that his practice in the future will be as follows: All duodenal ulcers will be

covered over by omentum, and a posterior gastro-enterostomy by the Mayo or Moynihan technic performed, without artificial obstruction. Or, in certain cases, it is convenient to excise an ulcer near the pylorus combined with a Finney pyloroplasty. Gastric ulcers on the lesser curvature, which are small and indurated, will be treated by the Balfour cautery plus the Finney pyloroplasty, or gastro-enterostomy. Large ulcers in other parts of the stomach will be treated by first doing a gastro-enterostomy, or a Finney pyloroplasty, followed by Sippy's plan of medical treatment, with a resection later, if necessary. Ulcers involving a very large area of the wall of the stomach may be given rest and the patient nourished by jejunostomy. Ulcers near the pylorus, having a suspicion of cancer, will be treated by the Rodman operation done in two stages.

128. **Compound Fracture of Skull.**—Kann's patient was struck on the forehead by the blade of a powerful electric fan. The frontal bone was cut just above the supra-orbital margin a little more on the right side and broke in two pieces at the crest of the attachment of the falx cerebri. The pieces of frontal bone missing measured 8 by 10 cm. The mental status of the patient is given as follows: The chief characteristics appear to be a marked indifference, with lack of spontaneity, defective memory for the period following the accident, but with excellent memory for the remote past; defective calculation, judgment poor and insight absent. No delusions, illusions or hallucinations. Orientation for time, place and person correct.

131. **Closing Skin in Abdominal Incisions.**—The suture which White has found quite satisfactory is one which he terms a continuous vertical mattress. The material usually employed is No. 00 or No. 000 chromic catgut, though fine silk or linen under some conditions is preferable; any needle of small diameter, straight or curved, may be used, this being a matter of personal choice. The suture should have a knot or small loop tied in the long end, or fixed by a split knot and begun by taking a deep suture to include the entire thickness of the skin, from one side of the incision to the opposite, about 1 cm. from the edge. The needle is then reversed in the holder, and the suture passed obliquely toward the other side, or the side on which the suture was started, barely engaging the edges of the wound. The needle is then introduced a trifle lower, on the side on which it originally entered, 1 cm. from the edge and the first deep suture is repeated. These deep and superficial sutures are continued until the wound is closed, drawing up the thread gently as each suture is completed.

133. **Simple Preparation of Field of Operation.**—The evening before the operation Foster has the field carefully shaved and well sudsed. It is then rinsed with sterile water and carefully dried with sterile towels, after which it is covered with dry sterile gauze and a binder applied to keep the gauze in place. This is all the preparation made before taking the patient to the operating room. On the operating table, when the patient is yet but semi-anesthetized, the field of operation is made bare and all covering is walled off with carefully placed sterile towels. The dry field of operation is then carefully and thoroughly bathed with gasoline. The gasoline coat is wiped off very thoroughly with sterile gauze, and the entire field is then carefully bathed with 70 per cent. alcohol which is allowed to remain without being dried. The field is now ready for operation.

Texas State Journal of Medicine, Fort Worth

February, XII, No. 10

135 Hemorrhagic Tendency in Obstructive Jaundice and Its Preoperative Treatment. F. W. Aves, Galveston.—p. 382.
136 Diseases of Accessory Nasal Cavities. M. E. Taber, Dallas.—p. 386.
137 Complications of Accessory Sinus Disease. W. P. Breath, Galveston.—p. 387
138 Diagnosis of Nasal Accessory Sinus Disease. J. H. Foster, Houston.—p. 389.
139 Blood Clot Method of Treating Mastoiditis. W. R. Thompson, Fort Worth.—p. 392.
140 Glass Sphere Implantation. W. Ralston, Houston.—p. 394.
141 Enucleation of Eye Followed by Fat Implantation. J. W. Head, Fort Worth.—p. 395.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

February 5, I, No. 2927

1 *Influence of Antiseptics on Activities of Leukocytes and Healing of Wounds. C. J. Bond.—p. 145.
2 Diseases of Male Urethra. F. S. Kidd.—p. 148.
3 Salvarsan Treatment of Syphilis: Analysis of Two Hundred Cases. L. Jones and A. J. Gibson.—p. 152.
4 *Simple Dietetic Treatment in Diabetes Mellitus. R. T. Williamson. —p. 154.

1. **Influence of Antiseptics on Leukocytes.**—Certain facts about the iodin reaction in leukocytes and other cells, Bond believes, have an important bearing on phagocytosis and immunity. Even in health a large proportion of the white blood corpuscles normally give, under certain conditions, a color reaction with iodin, which is closely related to, if not identical with, the so-called glycogen reaction met with in the same cells in disease. The reaction Bond describes occurs not only in the white blood cells, but in many pus cells, in some of the cellular elements of granulation tissue, in some marrow cells, and in the cells of certain cancerous tumors. The cells which gave the mauve reaction are the finely granular polymorphonuclear leukocytes. The large mononuclears and the small lymphocytes do not usually give the reaction, and Bond has not detected it in the eosinophil cells. A considerable proportion of pus cells from a healthy granulating wound will show the characteristic mauve reaction. Pus aspirated from an empyema or an acutely infected knee joint may fail to give the reaction when first withdrawn, whereas, if the discharge which flows freely from the empyema or the joint cavity be examined a few days later, after efficient drainage has been established, quite a number of the cells will show the mauve colored exudation. The capacity to give the iodin mauve color reaction depends largely on the vitality of the pus cell, and pus cells which have lain for some time in a closed cavity in a tryptic medium, have undergone partial cytolysis. It is the living leukocyte which has recently emigrated from its natural environment—the blood or lymph stream—which shows the reaction. This fact must be borne in mind in making use of the reaction as an indication of the healthiness of a wound. On the whole, efficient drainage and the establishment of a flow of rapidly renewed phagocytes seems to have more influence on the iodin reaction than the nature of the solutions used in the treatment of the wound. The iodin reaction is not confined to the cells of the purulent discharge. If a small portion of healthy granulation tissue be removed from a wound and examined in salt solution while alive, and a 1 per cent. watery iodin solution be added, a considerable number of the cellular elements will show the mauve colored exudation. If a small piece of healthy red marrow be examined in 1 per cent. watery iodin solution a considerable number of the marrow cells will show the mauve colored reaction.

Bond thinks there can be little doubt that the substance which gives the mauve colored reaction with iodin in the white blood cells in health is either glycogen or a precursor of glycogen, possibly a complex substance, from which, as the result of emigration, the carbohydrate molecule may be concerned with the elaboration of ferments or antibodies formed by the phagocytes in response to a toxin. Cancer cells from some actively growing cancers give the mauve reaction when examined fresh in salt solution and iodin; they also (like some pus cells) give the mahogany reaction when treated with iodin vapor. The iodophil substance in leukocytes is not destroyed by foreign serum and the iodophil substance may be present in leukocytes in an infected area though absent in leukocytes drawn from the general circulation. A personal observation made by Bond shows the intimate association between the circulation of bacillary toxins and the occurrence of iodophilia in the leukocytes. It also shows the phases of increased formation of iodophil substance by the phagocytes—first the increase in the extracellular soluble mauve colored exudation, then the occurrence of the less soluble intracellular mahogany colored deposit.

Both these occur before any corresponding change can be detected in the leukocytes in the general blood stream, and they are still present in the incubated leukocytes for some time after the constitutional reaction to the infection has disappeared. This shows the close association which exists between leukocytic activity in response to infection and the formation of an iodophil substance by the phagocytes.

4. **Dietetic Treatment of Diabetes.**—The treatment employed by Williamson lasts for a week or ten days only; during this period the patient ceases work and rests. Every two hours from 8 a. m. to 10 p. m. he receives a small amount of food—eggs, cream, milk, beef tea and tea according to the following diet sheet: 8 a. m. coffee or tea, with one tablespoonful of cream. One egg (poached, boiled or buttered); 10 a. m., a glass of warm milk (half a pint); 12 noon, custard (prepared from one egg and half a pint of milk); 2 p. m., a glass of warm milk (half a pint); 4 p. m., tea, with one tablespoonful of cream. One egg (poached, boiled or buttered); 6 p. m., cream, two tablespoonfuls in half a pint of warm beef tea; 8 p. m., a glass of warm milk, or one egg beaten up and added to half a pint of warm beef tea; 10 p. m., cream, two tablespoonfuls in half a pint of warm beef tea. The order of these meals may be varied or slightly modified as the patient desires. The patient takes no other food. The bowels are kept regular. Williamson claims that in many cases the glycosuria ceases in a few days, in other cases in a week or ten days, although an ordinary rigid diabetic diet had failed to check the sugar excretion.

Edinburgh Medical Journal

February, XVIII, No. 2

5 *Comparison of Some Antiseptics in Respect to Their Diffusibility, Action on Leukocytes and Action on Ferment Activity. H. E. Magee.—p. 86.
6 Etiology of Disseminated Sclerosis. B. Bramwell.—p. 96.
7 War Injuries of Ear. J. S. Fraser.—p. 107.
8 Case of Idiopathic Dislocation of Eyeball. D. M. Greig.—p. 129.

5. **Comparison of Some Antiseptics.**—In order to demonstrate wherein antiseptic solutions differ from each other, a comparative study was made by Magee of some of the commoner bactericidal agents in regard to diffusibility, chemiotactic action, and action on ferment activity. To prevent ferment activity of any kind in an infected wound is the most important indication. Chinosol was by far the most diffusible substance dealt with, and tincture of iodin the least. Thymol and potassium iodid occupy first place as positive chemiotactic substances. Salicylic acid and low concentrations of sodium bicarbonate have a much less marked effect. Dakin's solution, phenol, sodium fluorid and fairly strong solutions of acetic acid are decidedly negative chemiotactic substances, while quinin and weak acetic acid have a much less pronounced action. Chinosol, physiologic saline solution, camphor, strong solutions of sodium bicarbonate, have only a slight influence on the white corpuscles. Antiferment chemical substances fall into two main groups: (1) protein precipitants; (2) true antiferments. The members of the former group inhibit ferment activity in three ways: (*a*) by removal of the ferment by precipitation; (*b*) by a direct antiferment action; (*c*) by combining with the substrate. As the result of the ferment action, amino-acids and the antiseptics are set free. Quinin and chinosol not being protein precipitants, must be placed in the second group. They stop tryptic action in low concentrations. Magee is of the opinion that it is safe to assume that their action is specific in nature.

Practitioner, London

February, XCVIII, No. 2

9 *Intrathoracic Aneurysm; Report of Cases. W. J. Fenton.—p. 101.
10 *Epidemic Nephritis. W. L. Brown.—p. 111.
11 Sudden Death. B. H. Spilsbury.—p. 132.
12 Eczematoid Ringworm of Hands, Feet and Groin. J. M. H. Macleod.—p. 146.
13 Uses of Some Electric Methods in War Injuries E. L. Ash.—p. 155.
14 Treatment of Cough. A. Stewart.—p. 159.
15 Parodontal Disease. J. E. Blomfield.—p. 165.
16 Severe Case of Tetanus Treated with Repeated Intrathecal Injections of Antitoxin; Recovery. C. Worster-Drought.—p. 182.
17 Excision vs. Amputation in Certain Cases of Sarcomas of Long Bones. P. J. Byrne.—p. 189.

9. **Intrathoracic Aneurysm.**—The history of three cases is cited by Fenton. All three patients were about 48 years of age. The first man dated his symptoms from lifting heavy casks, five years ago. Shortly afterward he began to get short of breath, and developed a cough. The second patient, likewise, was accustomed to lift weights, the third was a general laborer. All three have had syphilis, the first two admit infection, and have a positive Wassermann reaction; but the third denies having had syphilis, though he admits gonorrhea twenty years ago. In this case, the Wassermann was positive likewise. In these three patients, the common etiologic factor was specific infection and occupational stress.

10. **Epidemic Nephritis.**—Up till the end of June, 1915, 1,062 cases of epidemic nephritis had occurred in the British army. Brown has made a careful study and analysis of 166 cases. As to etiology, he believes that this epidemic has disposed of the tradition that exposure is a very important cause of nephritis. While the troops were enduring much cold and exposure there were but few cases of nephritis; it was not until the weather was better that the disease assumed epidemic proportions and the cases continued to increase into the summer. The water supply did not appear to play any rôle, neither did the lead used in the tinning of foods or diet. Other suggested causes such as suppressed scarlet fever, dysentery and typhoid, exacerbation of chronic nephritis, antityphoid inoculation and trench fever are also disregarded. Brown favors the infection theory, which, he says, easily accounts for the pathology and the clinical course. Investigations were next made as to infection by an ultramicroscopic filter passer. A definite illness was produced in rabbits and monkeys after an incubation period of eight days by injections of urine prepared so as to be free from bacteria, but containing any filter passer present. The relative frequency of different symptoms was as follows: edema, 97 per cent.; headache, 77 per cent.; dyspnea, 76 per cent.; pains in the back, 60 per cent.; cough, 51 per cent.; sore throat, 27 per cent.; vomiting, 24 per cent.; retinal changes, 18 per cent.; diarrhea, 16 per cent.; nausea, 12 per cent., and fits, 4 per cent. Other symptoms which have occasionally been observed are herpes and parotitis, both of which suggest an infective origin.

Archives des Maladies du Cœur, etc., Paris

January, X, 1, pp. 1-48

18 *Disturbances in Lungs and Pleura in the Course of Heart Disease. (Formes cliniques des accidents pleuropolmonaires chez les cardiaques.) H. Vaquez.—p. 1.
19 Unilateral Paradoxic Pulse with Subclavian Arteriovenous Aneurysm. D. Danielopolu and V. Danulescu (Bucharest).—p. 13.

18. **Pleuro-pulmonary Symptoms with Heart Disease.**—Vaquez discusses the various complications of heart disease that may develop in lungs or pleura, ranging from simple dyspnea during exertion and cardiac asthma to functional disturbances without anatomic basis, pulmonary edema, congestion and edema, and the apoplexy sometimes discovered postmortem. He regards cardiac asthma as something analogous to the angina pectoris that comes on when reclining, or like pulmonary edema, all are the result of insufficiency of the left ventricle. He has known cardiac asthma to merge insensibly into pulmonary edema. The latter he explains as of mechanical origin, the result of an afflux of serous fluid into the lung when the pressure in the pleura, previously positive, changes to negative. Intravenous injection of saline, in animals, has been known to bring on acute edema of the lungs, and Achard and Laubry have witnessed its development in persons with insufficient kidneys after subcutaneous injection of physiologic salt solution. Vaquez has noted the same in persons with high arterial pressure and general arteriosclerosis. Ingestion of excessive amounts of fluids may have a similar effect. Distension of the ventricles, especially of the left, is the immediate cause of edema of the lungs. A nervous factor may be superposed, but the overloading of the heart is the main thing. Pleurisy is frequent with heart disease, he continues; patients with mitral insufficiency, pleural adhesion or myocardial degeneration are particularly liable to pleurisy. It usually locates on the right side, probably

secondary to the congested condition of the liver, and it displays a marked tendency to recurrence. The aggravation of the dyspnea is often the only symptom to call attention to it. The effusion increases slowly and progressively. He adds that the effusion should be tapped even when it does not seem very abundant; the amount withdrawn often surpasses the anticipations. The relief from evacuation of the fluid is liable to be marked, the heart being thus enabled to work properly once more and to respond to digitalis, when before digitalis seemed to have lost all efficacy. Sometimes eight or ten punctures may be necessary; he had one patient who required forty.

Journal de Médecine de Bordeaux

January, LXXXVIII, No. 1, pp. 1-20

20 Impressions of a Surgeon at the Front. Charbonnel.—p. 3.
21 Summer Diarrhea in the Troops. (Les entérites dysentériformes estivales des troupes en campagne.) Chayron.—p. 9.
22 Paratyphoid Fever plus Dysentery. J. Carles and Charrier.—p. 13.
23 Food Value of Tendons and Fascia Tissue. P. Carles.—p. 16.

Paris Médical

January 13, VII, No. 2, pp. 37-52

24 *Pathogenesis of Gonococcus Infection. (Action des courants énergétiques de l'organisme sur l'automotilité du gonocoque.) E. Roucayrol.—p. 37.
25 Apparatus for Continuous Extension for Fractures. M. Deguy.—p. 43.
26 Albuminuria in the Troops of the Far Eastern Front. Massy and C. Richet, Jr.—p. 47.
27 *Shrapnel Ball Entering the Shoulder Passes through Right Auricle into Femoral Vein. Grandgérard.—p. 48.

24. Pathogenesis of Gonococcus Infection.—Roucayrol insists that the urethra, while it may be the portal of entry for the gonococci, does not detain them. They soon spread to a distance, but not by the lymphatics and not by the blood. They are seldom and only transiently found in the blood. He thinks it more likely that they pass upward by way of the nerves, and he gives diagrams to show how the electric charge of the gonococcus might aid in its transportation along the nerves, the natural electric currents of the nerve serving to propel it along by the rotation of the gonococci. In any event, general gonococcus infection must be reckoned with almost from the very first.

27. Migration of Projectile through the Heart.—The shrapnel ball entered at the shoulder and its course was traced, by radioscopy as it entered and lingered in the right auricle and passed thence into the inferior vena cava and the femoral vein, finally lodging in the hypogastric vein, all without inducing any appreciable symptoms. The practical lesson from the case is that it may be possible to learn the manipulations that would expel a projectile from the heart, and thus facilitate its removal by a minor operation, instead of incising the heart itself. In this case the vein was so difficult to reach and suture that the ball was left in it, with merely a ligature thrown around it to prevent further migration of the projectile.

Presse Médicale, Paris

January 4, XXV, No. 1, pp. 1-8

28 *Simplified Technic for Vaccination against Typhoid and Paratyphoid. (Réduction du nombre des injections employées pour la vaccination mixte antityphoidique et antiparatyphoidique A et B.) F. Widal and A. T. Salimbeni.—p. 1.
29 Paralysis of Superior Facial Nerve with Cerebral Hemiplegia. M. P. Le Damany.—p. 1.
30 Local Eosinophilia with Factitious Conjunctivitis. J. Bollack.—p. 3.

28. Simplified Technic for Antityphoid Vaccination.—Widal and Salimbeni use a simple emulsion of typhoid and paratyphoid A and B bacilli killed by heat in 9:1,000 saline. It contains 10 billion germs to each 3 c.c. This amount is injected, first 1 c.c. and then 2 c.c. after a seven day interval, and this is all. Nearly 5,000 persons given this concentrated vaccine showed no more reaction than is customary with the weaker vaccines, while the antibodies were found later in the blood as abundant as in those given the usual four doses. They have given the total dose at once to a number of persons while others in the same environment were given the two or the four doses. These persons are now being supervised to learn the difference in the effect with the various technics. To date the advantages seem all on the side of the stronger vaccine, with fewer injections.

Progrès Médical, Paris

January 6, XXXII, No. 1, pp. 1-8

31 Spastic Brachial Diplegia Following War Wounds of the Neck. M. Dide and J. Lhermitte.—p. 1.
32 Traumatic Hemianopsia in Quadrant Form. E. Ginestous.—p. 3.
33 Perverse Sexual Psychology. (A propos de Sacher Masoch.) P. Voivennel.—p. 4.

Correspondenz-Blatt für Schweizer Aerste, Basel

January 6, XLVII, No. 1, pp. 1-32

34 *Study on the Cadaver of Frank's Subcutaneous Symphyseotomy. O. Burckhardt.—p. 1.
35 Surgical Experiences in Swiss Military Hospital. A. L. Vischer.—p. 19.

January 13, No. 2, pp. 33-64

36 War Fractures of the Femur. (Kriegschirurgische Erfahrungen bei der Behandlung von Oberschenkelfrakturen.) J. Ledergerber and F. Zollinger.—p. 33. Commenced in No. 1 p. 10.

34. Subcutaneous Symphyseotomy.—Burckhardt has been doing symphyseotomy on cadavers by various technics, and asserts that Frank's subcutaneous method is easy to apply and no special instruments are required for it, while anatomic study of the parts afterward fully justifies the claims that have been made for it. The incision in the lower part of the symphysis and in the suspensory ligament of the clitoris allows the latter and the urethra to sag loosely, which leaves an open space between the edge of the symphysis and the clitoris region. There was no injury of soft parts on any of the cadavers, not even the young nulliparae. The incision in the skin is no longer than the width of the scalpel blade, and it can be sutured securely. Frank's innovation of cutting from below upward entails a number of advantages, the importance of which is scarcely realized except by study of conditions on the cadaver. Burckhardt declares that it places symphyseotomy at once in the hands of the general practitioner, but he warns that we must not expect the impossible from it. A true conjugate of 7 cm. or, at the utmost, 6.5 cm. is the extreme limit. He undertook the research to aid him in his own practice, but found matters so surprisingly encouraging that he reports them in detail.

The scalpel is introduced at the middle of the symphysis, and the lower half and clitoris suspensory ligament are severed. Then the scalpel is drawn out of the symphysis, below, and its blade is pressed against the front of the upper half of the symphysis, cutting it through from the front, the scalpel always in the one hole in the soft parts through which it entered. This small hole can be sutured at once or covered with a tampon until after delivery. Burckhardt found the symphysis from 36 to 51 mm. high and from 18 to 26 mm. thick in fourteen female cadavers. In thirteen others, from 15 to 91 years of age, the range was 42 to 52 and from 14 to 30 mm. respectively. He lists these measurements in detail, comparing them with the height. As the clitoris sags as its ligament is divided, it drags its vessels out of the way. The vessels behind the symphysis are separated from it by a layer of tissue, and no important vessels of any kind are encountered on the median line.

Deutsche medizinische Wochenschrift, Berlin

January 4, XLIII, No. 1, pp. 1-32

37 *Digitalis Treatment and Arrhythmia. H. Boruttau and E. Stadelmann.—p. 1.
38 *Physical Exercise as Influencing the Weight of the Heart. (Die Beeinflussung des Herzgewichts durch körperliche Arbeit.) W. Dibbelt.—p. 4.
39 *Hernia and War. (Eingeweidebrüche und Krieg.) F. König (Marburg).—p. 6.
40 *Ferments of the Cerebrospinal Fluid in Man. E. Leschke and L. Pincussohn.—p. 8.
41 Psychogenous Tremor. (Das ideogene Moment in der Entstehung des Zitterns bei Kriegsteilnehmern.) W. Fürnrohr.—p. 9.
42 *Contralateral Treatment of Functional Paralysis and Contracture. Stulz.—p. 12.
43 *Traumatic Scarlet Fever. S. Korach.—p. 12.
44 Hormonal in Treatment of Dysentery. G. Zuelzer.—p. 14.

45 The Prognosis with Conservative Treatment of Abdominal Wounds. (Die Aussichten der konservativen Behandlung Bauchverletzter im Bewegungskrieg.) C. Jacobs.—p. 15.
46 Sterilization of the Hands in First Aid to the Wounded. (Die Händedesinfektion beim Verbinden, besonders im Kriege.) Renner.—p. 18.
47 Advantages of Certain Mineral Waters in Treatment of Nephritis. (Sind Brunnenkuren bei Behandlung der Nephritiker zweckdienlich?) Lenné.—p. 18.
48 Bone Marrow as Nourishing Food. (Knochenmarkmehl zur Hebung der Volksernährung.) Werckmeister.—p. 19.
49 Fraudulent Alleged Substitutes for Food. (Gegen den Schwindel mit Lebensmittelersatz.) J. Schwalbe.—p. 20.

37. **Digitalis Treatment of Arrhythmia.**—Boruttau and Stadelmann expatiate on the insight into arrhythmia in recent years afforded by electrocardiography. It has shown that constant arrhythmia often occurs with a comparatively sufficient heart. This has hitherto been entirely overlooked when the intervals between the pulse beats do not show extreme and sudden differences. Very small doses of digitalis restore conditions promptly to approximately normal in these cases, slowing the heart beat and strengthening the pulse, and the phenomena from stasis subside. Fahrenkamp has recently published a study of this subject based on 412 cases of heart disease. His conclusions are said to sustain those emphasizing the value of very small doses of digitalis long kept up in treatment of arrhythmia perpetua. The digitalis should be supplemented and alternated with diuretics and the mode of life and diet regulated to correspond. The digitalis can be given repeatedly or continuously, under control of electrocardiography. The latter is as indispensable here as for the certain diagnosis of the arrhythmia perpetua and its differentiation from other conditions which call for different treatment. Seven cases are described in detail to show the more serious types liable to be encountered. The experiences related demonstrate the retarding action of small doses of digitalis on the overfrequent beat of the auricles bordering on fibrillation. They think that the vagus is primarily involved in the retarding of the pulse by small doses of digitalis, as a similar result can sometimes be transiently obtained by compression of the vagi.

38. **Influencing the Weight of the Heart by Physical Labor.**—Dibbelt records the data from examination of the heart from twenty-two soldier cadavers, comparing them with the total weight, the occupation, etc. The men accustomed to manual work or doing such work under the conditions of the war, had as a rule strong, large hearts. All parts of the heart shared proportionately in the increased strength and weight of the body in general.

39. **Hernia in Wartime.**—König remarks that civilians are showing in a number of ways the pathogenic influence of the war, as in the greater prevalence of pyogenic infections, crops of boils and eruptions, explainable in part by alimentary disturbance and in part by the difficulty in getting bed and body linen washed on account of the poor quality of the soap. He has been impressed further by the remarkable frequency of hernia; for this he regards the loss of adipose tissue as responsible. The loss of flesh is the result of the change in the customary diet. This and the greater amount of roughage in the bowels, and often the unaccustomed physical labor for those past the vigor of youth, readily explain the frequency of hernia as another consequence of the war. The number of cases of incarcerated hernia in his service is also greater: from 40 in 1913-1914, to 68 in 1915-1916, and these almost all in civilians. This is the more remarkable as the proportion of civilians in his service is very much smaller. Femoral hernias have increased out of all proportion, and gangrene develops exceptionally rapidly after incarceration. Hernia into the abdominal wall was encountered in 30 per cent. of the operative cases last year; thirty-four died out of the sixty-three abdominal wall hernias that formed 11.5 per cent. of Riedel's total 550 hernia cases. König ascribes the prevalence of abdominal wall hernias to the stronger peristalsis that is the rule now on the war diet.

40. **The Ferments of the Cerebrospinal Fluid.**—Leschke and Pincussohn found diastase in all the cerebrospinal fluids they examined, taken from healthy persons and from patients with all kinds of different diseases. It was present only in very small amounts, and no regularity was apparent in any respect. The ferment content of the fluid seemed to be independent of the cell content. They never found any evidence suggesting the passage of ferments from the blood into the fluid. This they regard as testifying to the fact that the cerebrospinal fluid is a specific secretion, and not of the nature of lymph or a transudate.

42. **Contralateral Treatment of Functional Paralysis and Contracture.**—Stulz has often succeeded in curing hysteric contracture by getting the patient to imitate exactly with the sound mate the contracture of the affected side. When the patient sees that the contracture is such a simple matter to reproduce with the sound limb, he seems to lose his fear of it, and the contracture disappears spontaneously in the course of a day or so.

43. **Traumatic Scarlet Fever.**—The young physician had been repeatedly exposed to scarlet fever at different times but had never contracted it. After casual excoriation of one hand and further exposure to scarlet fever, he developed typical scarlatinal lymphangitis in forty-eight hours. By the third day he presented the general symptoms of scarlet fever with the exanthem. Korach compares with this the few similar cases on record.

Medizinische Klinik, Berlin

January 7, XIII, No. 1, pp. 1-30

50 Experiences with Field Surgery. F. Krause.—p. 1.
51 The Internal Medicine Course. (Antrittsvorlesung.) M. Matthes. —p. 3.
52 *The Difficulties of Differential Diagnosis of Convulsions. (Diagnostische Schwierigkeiten bei Krampfleiden.) G. Flatau.—p. 9.
53 Determination of the Limits of the Frontal Sinus by Percussion. (Methode zur Bestimmung der Stirnhöhlengrenzen und ihre diagnostische Bedeutung.) R. Goldmann.—p. 11.
54 Provisional Ligation in Shoulder or Pelvis Region of Artery Injured in Limb Below. (Versorgung verletzter Extremitäten-Schlagadern in der Nähe des Schultergürtels und des Beckenringes.) Busalla.—p. 14.
55 *Trauma in Etiology of Cancer. (Bösartige Geschwülste als Unfallfolgen.) v. Kuester.—p. 15.
56 Reasons Why Diseases, Germs and Signs Should Not Be Named for Those Who Describe Them First. K. Brandenburg.—p. 28.

52. **Differential Diagnosis of Convulsions.**—Flatau comments on the diversity of symptoms accompanying convulsions or their equivalents, and especially those just preceding them. Differentiation is particularly difficult when there is merely an aura without an actual seizure. When the patient suddenly sees things around as if removed to a distance or become very small, the trouble is more liable to be hysteria than epilepsy. He insists that an actual epileptic seizure must have occurred before it is possible to label the case as epilepsy. With convulsions at night, waking out of sleep, epilepsy is more probable, as also when convulsions occur without known cause. Fainting may sometimes be the first manifestation of a tendency to epilepsy. It is sometimes impossible to distinguish between a fainting attack and an attack of petit mal. With epilepsy, the loss of consciousness is comparatively brief, very rarely lasting longer than half an hour, while with hysteria, prolonged unconsciousness is the rule, although usually not equally profound all the time. The reaction to irritation during the loss of consciousness also differs. Violent flinging the arms around and curving the whole body (*arc de cercle*) speak for hysteria, but it is possible for an epileptic to have hysteric convulsions. The family history is also instructive. He has so frequently found a history of migraine in one of the parents that he has become convinced that there is a close connection between migraine and epilepsy. In conclusion he mentions a rare form of convulsions simulating the epileptic seizure but there is no inherited taint and no somnolence afterward; the attacks come on only after some emotional stress and only late in life and they are amenable to psychotherapy.

55. **Trauma as Factor in Cancer.**—In the case described a factory worker fell with one arm in boiling 10 per cent. sulphuric acid. The cicatrix from the corrosion kept getting inflamed, with eczema and ulceration, and final malignant degeneration of the scar tissue and death twenty-three years after the accident. A causal connection between the accident

and the cancer was admitted by the courts and workman's compensation was paid to the heirs.

Münchener medizinische Wochenschrift, Munich

December 19, 1916, LXIII, No. 51, pp. 1785-1820

57 *Intensive Roentgenotherapy of Uterine Hemorrhage. (Beseitigung von Myom- und Wechselblutungen in einmaliger Sitzung durch Zinkfilterintensivbestrahlung.) L. Seitz and H. Wintz.—p. 1785.
58 *Febrile Pernicious Anemia. F. Jessen and W. Unverricht.—p. 1787.
59 *Predetermination of Sex. (Zur willkürlichen Geschlechtsbestimmung.) P. W. Siegel.—p. 1787.
60 Prevention and Treatment of Diphtheria. F. Reiche.—p. 1788.
61 *The Diet with a Weak Heart. (Die rationelle Ernährung des schwachen Herzens.) A. Lorand.—p. 1790.
62 *Clinical and Functional Studies of Nephritis. III. H. Machwitz and M. Rosenberg.—p. 1791. Continuation.
63 Legal Decisions Affecting Physicians. (Aerztliche Standesangelegenheiten. XV.) P. Kaestner.—p. 1795.
64 Methyl Violet for Treatment and Dressing of Wounds. E. Baumann.—p. 1805.
65 Explanation of Hard Traumatic Edema of Back of Hand. G. Hohmann.—p. 1810.
66 The Difficult Differential Diagnosis of Typhus; Importance of Agglutination of Strain of Proteus. (Fleckfieber.) A. Soucek.—p. 1814.
67 Rebuilding the Orbit. (Neue Methode zerschossene und verunstaltete Augenhöhlen zu dehnen und zu formen.) B. Sachse.—p. 1815.
68 New Formation of Bone from Displaced Periosteum after Grazing Bullet Wound. L. Neugarten.—p. 1817.
69 Working Artificial Arm. Mosberg.—p. 1818.
70 Reeducation after Amputation of Leg. F. Kirchberg.—p. 1818.

57. **Cure of Uterine Hemorrhage under Single Intensive Roentgen Exposure.**—Seitz and Wintz report excellent results in cases of hemorrhage from myomas and climacteric hemorrhage from a single exposure to intensive Roentgen-ray treatment, using a 0.5 mm. zinc filter. This allows twice the dose practicable with an aluminum filter. Several fields are exposed, and with very sensitive patients it is better to fraction the total dose over two or three sittings. But it is possible to accomplish the desired result at a single four or five hour exposure, each field taking about an hour.

58. **Febrile Pernicious Anemia.**—In the case described the fever was remittent but without any regularity; attacks of pain and circumscribed swellings developed at various points but subsided completely. The patient was a man of 58 and the anemia was of the pure pernicious type. Some minute bodies were found in the blood and red corpuscles, and symptomatic benefit was realized under neosalvarsan, but the disease progressed in waves to final heart failure in less than a year. The same small bodies were found in the blood of a rabbit inoculated with the patient's blood, but to date the animal has shown no symptoms.

59. **Predetermination of Sex.**—Siegel's compilation of data showing a connection between the state of ripening of the ovum at the time of conception and the sex of the embryo has already been mentioned in these columns, Dec. 18, 1915, p. 2205. He now has records of 300 pregnancies following the brief leave of absence of the soldier husband from the front. He classifies the conception by four periods: from the first to the ninth day after the onset of menstruation; from the tenth to the fourteenth day, and from the fifteenth to the twenty-second. The remaining few days before the return of menstruation show so few conceptions that he omits this premenstruum period altogether from his tabulations. The findings in the latest series confirm his previous conclusions, namely, that a girl may be expected when the ovum is young, from the fifteenth to the twenty-third day. A boy is more probable when the ovum is overripe, that is, from the twenty-seventh day from the onset of menstruation to the ninth day following the onset of the next menstruation. During the periods between these the chances are about even for a boy or girl. One of his tables embraces 115 cases. It shows in the first to the ninth day period, 48 boys and 8 girls; from the ninth to the fourteenth, 10 boys and 14 girls; from the fifteenth to the twenty-third, inclusive, 5 boys and 26 girls; from the twenty-fourth to the twenty-sixth, no boys and no girls; from the twenty-seventh to the onset of the next menses, 4 boys and no girls. Pryll has recently published a somewhat similar series of 25 cases, his findings showing a similar connection with the ripening of the ovum. The young ovum (fifteenth to the twenty-third day inclusive) gave, in Pryll's series, 71 per cent. girls; in Siegel's series 84 per cent. girls. The overripe ovum, (two days before to nine days after the onset of menstruation), gave 86 per cent. boys (Siegel), and 82 per cent. (Pryll).

61. **The Diet with a Weak Heart.**—Lorand has often noticed that persons on a predominantly vegetable diet do not get fatigued so readily as on an abundant meat diet. He has also noted often a remarkable improvement in the muscular weariness of diabetics when they are placed on a vegetable diet. There seems to be something in vegetables and fruits that enhances muscular activity. This may be the explanation for the almost unbelievable capacity of the Bulgarian peasant for muscular work without fatigue; his food consists only of vegetables with black bread and a little cheese. Vegetables contain potassium, and the importance of this in the diet has been recently emphasized anew by Urbeanu who found that fowls and rats kept on an abundant albumin and ample calories diet, but deprived almost entirely of potassium, developed paralysis, hemorrhages, and other symptoms characteristic of deficit diseases, with fatal cachexia. The nerve substance was found very much degenerated in all the animals. If potassium was fed to them in time, they recuperated perfectly and grew strong again. Lorand's conclusion is that organic compounds of potassium are indispensable to keep nerve and muscle substance in normal condition. Human muscles, including the heart muscle, contain large proportions of potassium. Everything that promotes muscular functioning helps to keep the heart muscle in good condition, as well as the other muscles. Muscular fatigue is a prominent symptom in diseases of deranged metabolism, such as myxedema, exophthalmic goiter, and severe diabetes. The muscular fatigue under these conditions shows marked improvement on a cereal or vegetable diet. This supplies the needed potassium and phosphoric acid. Lorand thinks that the instinctive longing for bread and potatoes is due to their content in salts, etc., more than to their carbohydrate value. No other articles of food are missed so much as these in special diets. With a weak heart, particular care must be paid to these intangible elements in the diet. An unbalanced diet is especially dangerous with a weak heart. The heart action should be constantly supervised on an antidiabetic diet or obesity starvation diet; also on an antigout diet, and in the elderly with weak hearts. Any undernourishment of this kind might have very serious results in their case. The elderly should never be allowed to fast for religious purposes, and persons with weak hearts should never go long without food. Lorand adds that the dependence of the heart action on the intake of nourishment is shown by the facts, that the heart beat is less vigorous with a fasting stomach, and that in fatal disease the heart gives out entirely, that is, death occurs, in the early morning hours, when the stomach has long been empty.

62. **Treatment of Nephritis.**—In this third instalment of their study of nephritis, Machwitz and Rosenberg warn that with syphilitic nephrosis mercury must be used very cautiously as this has a toxic action on the same tissues, the epithelium of the tubuli, which suffer predominantly from the syphilis toxins. Salvarsan, on the other hand, does not have this by-effect on the kidneys, but, in giving it, we must not forget that salt and fluid have to be restricted as much as possible. With acute glomerular nephritis, rest in bed is the most important of all measures. Volhard had only 3 of his 71 cases of acute diffuse glomerular nephritis pass into a chronic phase, but Machwitz and Rosenberg say that of their 150 patients of this group only 74 recovered entirely; 12 died of uremia, 6 from heart failure and in 18 the disease passed into a chronic phase; 35 were improved but 5 others failed to improve and have probably developed a chronic phase. Of their 40 cases, chronic when first seen, only 11 had been kept in bed during the acute phase, including 6 who had been treated in the hospital. Absolute bed rest is imperative as long as there is any blood in the urine, and while there is still an appreciable albumin content in the urine much physical exertion should be avoided. Their experience has shown

that the albumin intake must not be over nor much below 30 gm. a day; the salt intake about 5 gm., and the fluids restricted to 1.5 or 2 liters a day. Daily analyses of the urine and repeated tests of kidney functioning over long periods in long series of cases have confirmed that it is immaterial so far as the kidneys are concerned, whether animal or vegetable albumin is given, meat instead of milk, and black bread or white bread. An exclusive milk diet would give more than the permissible albumin intake. Sweetened fruit juices are useful to supply calories in part of the fluid. Venesection is undoubtedly of benefit although the assumption that the retained albumin is thus released has not been sustained by recent research; the residual nitrogen does not decline but rather rises a trifle even after profuse venesection. With uremic convulsions, lumbar puncture is the sovereign measure. With chronic glomerular nephritis in the second phase with hypertonia and albuminuria but no functional disturbances, a light mixed diet is indicated. When it passes into the terminal phase, dietetic restrictions are of vital importance, cutting off from the diet as much nitrogen as possible, allowing only 3 or 5 gm. of salt. The residual nitrogen of the blood is the guide to treatment here. The article is to be continued.

Gazzetta degli Ospedali e delle Cliniche, Milan

January 4, XXXVIII, No. 1, pp. 1-16

71 Case of Partial Monoplegic Tetanus with Death from Supposed Anaphylaxis. T. Salvatore.—p. 5.

Pediatria, Naples

January, XXV, No. 1, pp. 1-64

72 *Improved Technic for Vaccination against Typhoid and Paratyphoid. (Nuovi metodi di vaccinoterapia antitifica ed antiparatifica.) G. Caronia.—p. 1.

73 *Interval before Immunization after Vaccination against Typhoid. (Sul tempo di comparsa dei fenomeni immunitarii nei bambini immunizzati con vaccino antitifico.) Pastore.—p. 38.

72. **Vaccines against Typhoid and Paratyphoid.**—Caronia says that vaccines made with bacilli killed by heat or chemical action, such as the Wright-Leishman, Pfeiffer-Kolle, Russel and Besredka vaccines and Vincent's first vaccine, are more effectual in prophylaxis than in curing the established disease. On the other hand, vaccines made with products of the bacterial body under the action of chemical, physical or biologic agents have actual curative value. This latter group includes the Wassermann vaccine, the Noguchi, Sclavo, Vincent's second, and the Di Cristina vaccine. Caronia regards the latter as especially promising, his experiences with it and with two vaccines made on the same principles were invariably favorable, as he describes in detail. The benefit seemed equally pronounced by the intramuscular or intravenous route. The strength should be kept up by nourishing food, semiliquid. He is convinced that many mishaps in typhoid have been ascribed to the disease when in fact the lack of nourishment was the decisive factor. The Di Cristina vaccine is made by mixing with a slightly alkaline bouillon (*acqua di carne*) blood from a typhoid patient. The blood must have pronounced agglutinating power and be mixed with the bouillon in a 5 per cent. dilution. The medium thus prepared is inoculated with from four to six typhoid strains and the whole set aside for two days. Then guinea-pig complement is added to complete the bacteriolysis, and the whole is incubated at 37 C. for another twenty-four hours, then centrifugated; phenol is added to 0.5 per cent. and the whole inactivated at 50 C. Caronia has modified this technic somewhat, his first vaccine being made with five or six typhoid strains grown on agar for from sixteen to twenty-four hours. Then the colonies are transferred to physiologic solution and fresh typhoid serum is added. This serum must be rich in agglutinins and amboceptors. The emulsion thus obtained is incubated at 37 C. for about seventy-two hours, then more fresh typhoid serum is added, with 0.5 per cent. phenol. The bacteria bodies not destroyed by this time are removed by centrifugating, and the whole is kept at 55 C. for an hour on three successive days. His second vaccine is made like Di Cristina's except that he adds, just before centrifuging, more fresh typhoid serum to replace the complement that has been used up. These three vaccines act about the same. Caronia's first vaccine has the advantage of not containing any extraneous substance (meat broth or guinea-pig serum), but it requires more typhoid serum. His second vaccine contains a larger proportion of the products from the lysis of the bacilli. Similar vaccines are made for paratyphoid. All these three vaccines displayed a potent action on typhoid patients, leading to resolution of the process in a few days and sometimes in a few hours. The general condition and the nervous system seem to feel the benefit first, then appetite returns and the bowel functioning becomes regular. There is usually a general reaction after each injection, most pronounced by the intravenous route, but the reaction is less at each injection. The chart is given for each of the forty-five cases given this vaccine therapy alone.

73. **Immunization Process under Vaccine Therapy.**—The preceding article is from the clinic at Naples. Pastore is intern at the Palermo clinic in charge of Di Cristina, and here reports experiences there with a number of children given preventive injections of antityphoid vaccine made by the current technics in vogue. The aim was to determine how soon after the injection the serum acquired agglutinating and complement-deviating properties. The effect of the various vaccines was tested and recorded according to the length of the interval before the immune bodies appeared in the serum. She found the Wassermann and Kolle vaccines most powerful. The Di Cristina and the Caronia vaccines took a little longer and slightly larger doses were required to accomplish the same result.

Policlinico, Rome

January 7, XXIV, No. 2, pp. 41-72

74 Emergency Treatment of Deep Wounds. (Sulla cura dei feriti gravi cavitari in un' ambulanza chirurgica avanzata.) R. Alessandri.—p. 41.

75 Test to Estimate Hardness of Roentgen Tubes. L. Siciliano.—p. 45.

76 *Iodin Treatment of Tuberculous Epididymitis. (Caso di tubercolosi dell'epididimo guarito con la cura alla Durante.) A. Sofia. —p. 55.

76. **Iodin Treatment of Tuberculous Epididymitis.**—The man of 24 had a fistulous epididymitis, and Sofia gave him a local injection of Durante's iodo-iodid solution every fourth day and a subcutaneous dose every day. The cure was almost complete by the end of a year and a half, the process having subsided to a few soft and indolent minute lumps.

[Durante's solution is a mixture of iodin, potassium iodid and distilled water, usually in the proportion of 1 part iodin, 3 parts potassium iodid, and 100 parts distilled water.]

Semana Medica, Buenos Aires

1916, XXIII, No. 45, pp. 457-482

77 Classification of Inorganic Acids. (Separacion y caracterizacion sistematica de acidos de un mismo grupo.) P. J. Pando.—p. 457.

78 Influenza in 1916. (Consideraciones acerca de la epidemia de grippe de este año.) J. Solari.—p. 466.

79 *Suggestion to Aid in Radioscopy of the Lungs. C. Heuser.—p. 474.

80 *Lymphocytosis in Syphilis. C. P. Mayer and A. C. Gourdy.—p. 475. Continuation.

No. 46, pp. 483-510

81 High Application of Forceps. (Consideraciones sobre la aplicacion de forceps en el estrecho superior.) J. C. L. Massini.—p. 483.

82 The Recent Epidemic of Influenza. J. C. Mira.—p. 485.

83 *Genital Prolapse. T. J. Piccardo.—p. 499.

79. **Device to Facilitate Radioscopy of Lungs.**—Heuser uses in radioscopy a screen of paper on which are fastened strips of lead running entirely across the screen, each 10 mm. wide, leaving spaces of 1 cm. wide between them. The effect of this, as is well known in optics, is to make the light strips much clearer to the view by this kind of doubling of the field to be inspected. This innovation was suggested to him by looking out through the slits in a window blind. He says it is like a segmented diaphragm, rendering it much easier to compare the lung on the two sides.

80. **Lymphocytosis in Syphilis.**—This part of Mayer and Gourdy's long serial article shows that lymphocytosis is liable to be not only the earliest sign of syphilis but that it persists and may increase during the secondary phase of the disease. (Their article was summarized in these columns Feb. 24, 668, as two months' issues of this exchange were received at one time.)

83. Genital Prolapse.—Piccardo regards genital prolapse as an ordinary hernia, the vaginal wall representing the hernial sac, and he treats it on this basis, like any hernia. The details of ten cases are tabulated to show the advantages of this vagino-perineal plastic method of treatment, and also to show the importance of the levator ani in correction of the prolapse.

Siglo Medico, Madrid

January 6, LXIV, No. 3291, pp. 1-16

84 *Vinegar-Water and Acid Wines in Treatment of Typhoid and Paratyphoid. B. G. Alvarez.—p. 2.
85 Asphyxiating Gases as Weapon in War. F. Rabena.—p. 3.
86 Colitis with Ulceration and Erosions. L. Urrutia.—p. 4.

84. Vinegar in Typhoid.—Alvarez expresses surprise that more attention has not been paid to the statement of A. Loir, three or four years ago, to the effect that 20 gm. of vinegar in a liter of contaminated water kills bacteria in it, including those of the typhoid group. The same occurs when the water is mixed half and half with an acid wine. It has been Alvarez' experience in forty years of practice to give typhoid and paratyphoid patients an abundance of acid drinks, and he ascribes his clinical success mainly to this fact. He formerly used lemonade or diluted wine, but has lately used the vinegar water more and more, or hydrochloric acid lemonade. The mortality in his cases has been small and always from complications.

Russkiy Vrach, Petrograd

1916, XV, No. 46, pp. 1081-1104

87 Some of the Medical-Surgical Sanitary Problems at the Front. N. A. Velyaminoff.—p. 1081. Concluded in No. 47, p. 1108.
88 The Russian Substitutes for Salvarsan. (Arsola, arsenola i benzarsan.) V. V. Ivanoff.—p. 1088; Idem. M. N. M. Aitova.—p. 1095.

No. 47, pp. 1105-1128

89 Some Unpublished Letters of Pirogoff. (N. I. Pirogoff nakanunie professuri.) S. Y. Shtraikh.—p. 1105.
90 Bacteriologic Technic as Modified for War Conditions. B. A. Bolter.—p. 1117.
91 Operative Treatment of War Wounds of the Skull. M. S. Astroff. —p. 1119. Conclusion.
92 *The Spleen as a Regulator of Blood Production. (O vliyanie selezenki na krovetvornuiu sposobnost kostnago mozga.) B. N. Stradomsky.—p. 1122.

92. Influence of the Spleen on the Blood-Producing Function.—Stradomsky reports the results of experimental research and clinical experience which seem to have demonstrated that the spleen has a twofold hormone action on the bone marrow. It seems to have an inhibiting action on the production of red corpuscles in the bone marrow, while at the same time it stimulates to increased destruction of reds. In normal conditions these two influences balance each other, but when the spleen hormone is abnormal or lacking, the bone marrow produces unlimited quantities of reds but their quality deteriorates. They die off more readily, and this increased erythrolysis sets up an automatic vicious circle. Among the facts on which these assumptions are based are the increased numbers of red corpuscles found in the blood stream after splenectomy, the number rising in the course of one, four or six weeks after the removal of the spleen, while almost at once afterward the red corpuscles present the Howell-Jolly bodies, showing that these reds are young, immature forms. These findings indicate that the bone marrow is functioning to excess after having been released from the controlling influence of the spleen hormone. After splenectomy, administration of spleen extract is liable to give results confirming this rôle of the spleen and its extract as a regulator of blood production. Another argument in favor of his assumptions is the atrophy of the follicles in the spleen to which Hutchinson and others have called attention in cases of polycythemia. It might be objected that polycythemia would follow in every case of disease of the spleen, but the diversity of pathologic conditions in the spleen may leave some parts of the organ intact, at least enough to produce sufficient of the hormone to prevent excessive production of reds. There is also a possibility that the bone marrow may not respond in every case always in the same way. Another objection is that the efficacy of spleen extract in treatment of anemia seems to contradict his views, but he explains this away by certain biologic laws on the effect of small doses in contrast to that from large amounts. The work issues from the pathologic laboratory and clinic of the University of Kharkov.

Mitteilungen a. d. Fakultät der k. Univ., Tokyo

1916, XV, No. 3, pp. 397-542. German Edition. Last indexed May 27, 1916, p. 1751

93 Vasoconstrictor Action of Human Serum on Isolated Heart of Frogs Probably Due to Globulin Content. S. Sakai and T. Hiramatsu.—p. 397.
94 *Chief Mode of Infection with the Ankylostoma Duodenale and Its Route after Oral Infection. Y. Miyagawa.—p. 411.
95 *Prophylaxis of Infection with Japanese Schistosoma. (Veränderungen der Eier des Schistosomum japonicum under den Einwirkungen verschiedener physikalischen und chemischen Agenzien und über einige prophylaktische Massregeln der Schistosomiasis.) Y. Miyagawa.—p. 453.
96 *Pancreatic Diabetes. (Experimentelle Untersuchungen über Pankreasdiabetes mit bes. Berücksichtigung des Eiweissabbaues und der Zucker- und Glykogenbildung aus Eiweiss.) K. Ujihara. —p. 477.

94. Modes of Hookworm Infection.—Miyagawa gives four double page charts showing the findings in different phases of his research. His work is accompanied by five photographic plates with twenty microscopic views. He states that sunlight is not necessary for the development of the eggs but rather detrimental, while oxygen and moisture are indispensable. He also states as a fact that ankylostoma eggs can be easily destroyed by mixing the egg-containing fecal material with urine and allowing it to putrefy well. This he regards as extremely important from the practical standpoint. The larvae can be collected most readily by placing a small dish of pure water in a larger Petri dish containing the egg-laden fecal material. As the larvae hatch out, they collect in the water dish as they seek water, and they will be found assembled in this dish in from ten to thirty days. Whether infection occurs by the mouth or through the skin the larvae pass into the lung tissue to begin their development, and they are more resistant to chemical action thereafter than larvae that have not been in lung tissues. The young ankylostomas coming from their trip through lung tissue are able to resist the action of gastric juice for twenty-four hours. The chief mode of infection with the ankylostoma is through the skin. This he proved by experiments on dogs in open fields. The larvae are so resistant to lime and other salts that encysted larvae retained their vitality after being kept for six hours in milk of lime, and for twenty-four hours in the same twice diluted.

95. Prophylaxis of Infection with Asiatic Blood-Fluke.—Miyagawa reports that the results of his research show that if a lime-containing fertilizer (*Kalkstickstoff*) is scattered systematically over a field and its watercourses, all the schistosoma eggs and the intermediate hosts will be destroyed. The eggs in stools mixed with urine and putrefying all die in two weeks in summer and in sixteen days at other seasons. This fact makes it imperative not to deposit the egg-infested stools on open ground or allow them to get into running water. The most favorable conditions for the hatching out of these eggs is in running water.

96. Pancreatic Diabetes in Dogs.—Ujihara gives sixteen two or three page charts of the metabolic findings and other details in regard to dogs before and after removal of the pancreas and then treated with various substances. He states that his demonstrations of the direct formation of sugar from amino acid throws light on certain phenomena of glycogen production and metabolism, as he explains in detail. The article fills sixty-five pages, including seven pages of bibliographic references with the titles in full.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

December 30, 1916, II, No. 27, pp. 2321-2364

97 *Behavior of Entamœba Histolytica in Presence of Emetin in Human Intestines. J. R. Schiess and N. H. Swellengrebel.—p. 2328.
98 Epidemic Cerebrospinal Meningitis; Four Cases. F. J. Hagen. —p. 2335.

97. Behavior of Ameba under Emetin.—The daily ameba findings in the stools of a man of 50 are tabulated to final

recovery under emetin. The *Entameba histolytica* was found in large numbers at first, and later the minute or tetragena form, but in a cat inoculated with the ameba from the stools, only the histolytica form was found, as also in cat after cat inoculated one from another. In the entire series of sixteen cats, nothing but the histolytica form could be discovered. These experiences disprove Darling's assertions as to the diagnostic importance of this method of experimental inoculations. The development of the ameba in the cat does not reproduce the cycle of development as in man.

Finska Läkaresällskapets Handlingar, Helsingfors

December, 1916, LVIII, No 12, pp. 1755-1935

99 *Chromosomes and Heredity. (Kromosomer och ärftlighet.) H. Federley.—p. 1755.

100 *Familial Abnormally Large Cornea and Its Relation to Hydrophthalmos. (Om megalokorneas ärftlighet.) V. Grönholm.—p. 1792.

101 *Supernumerary Breasts and Nipples in Child-Bearing Women in Finland. (Om förekomsten af hyperteli och hypermasti hos puerperae i Finland, med särskildt beaktande af de s. k. axelhålemjölk körtlarna.) M. Schroderus and S. E. Wichmann.—p. 1813.

102 *Tuberculosis in a Finnish Province. H. Granfelt.—p. 1880.

99. **Chromosomes and Heredity.**—Thirty-three illustrations or diagrams accompany Federley's article in which he seeks to prove that Mendel's law is the result of the reduction of chromosomes in the maturing of the sexual cells. He reviews the more important publications in this line in the last few years, reproducing many of the illustrations, saying that the more important data have been obtained by parallel cytologic and experimental research. Complicated phenomena of heredity can be traced to the chromosomes.

100. **Familial Megacornea.**—Grönholm relates that he knows a family in which the five sons present a malformation in both eyes, the cornea being abnormally large. The father, mother and the daughter show no signs of the anomaly. The sons' ages range from 2 to 24 years. The diameter of the cornea is 14 mm. in one; 13 mm. in the other of the two brothers whose pictures are given. The normal diameter is about 10 or 11.5 mm. The eyeball itself does not seem unduly large. Two of the brothers have a zonular cataract in both eyes. The same megacolon is pronounced in two male cousins of the mother and in the two daughters of one of these cousins. In all, he found it in thirteen persons in the family, eleven males and two females, in the course of three generations. When a man with the anomaly married outside the family, his children were all free from it. But the daughters in the family, although free from the anomaly themselves, transmitted it to their sons when marrying outside the family. There are five instances of this in the family. The affected fathers have normal children, while the normal mothers have sons affected with the anomaly. A further remarkable feature of this family transmission is that the daughter of a normal daughter in the family likewise transmitted the anomaly to her sons. Grönholm states further that when a man with megacornea married a cousin whose father had the same anomaly, it occurs in his daughters, but if the cousin happens to be a nonconductor, his children will be free from it. The bilateral development and other features of the anomaly point to some constitutional rather than a local cause.

101. **Supernumerary Nipples and Mammary Glands.**—Schroderus and Wichmann found supernumerary mammary glands in 3 per cent. of the 3,350 women delivered at the Helsingfors maternity during their time of service there. This proportion is three times larger than any other yet published. In 41.7 per cent. the anomaly was bilateral; thus they had opportunity to examine 146 axillary mammary glands. About three-fifths secreted a fluid which microscopically seemed to be colostrum at first and actual milk later. In ten cases described more fully a glandular connection between the axillary mammary gland and the main gland could be palpated. These supernumerary glands were among the larger ones, but in none of the cases was there an actual complete mamma in the axilla. In two other cases, of which illustrations are given, the glands in both axillae grew very large as lactation commenced, but later subsided. In one woman each mamma was double, milk flowing from two nipples on each breast. The child nursed the four nipples in turn. The size of the axillary glands ranged from very small to 18 by 7 cm., but after the puerperium they shrank in size.

102. **Tuberculosis in Finland Province.**—Among the 5,300 persons of the Malak province only 3,960 were living there at the time of the examination; 1,700 had emigrated, mostly to America. The data in regard to tuberculosis are classified in fifteen tables; tuberculosis in some form was found in 6.87 per cent. of the 3,868 examined and in 3.14 per cent. of the children under 15. Active pulmonary tuberculosis was manifest in 1.03 per cent. of the adults and in 0.27 of the children examined.

Hygiea, Stockholm

LXXIX, No. 1, pp. 1-48

103 *Auditory Reeducation with Electric Sonorous Vibrations. (Erfarenheter med kinesiphone-terapi enligt Maurice.) G. Holmgren.—p. 1.

104 Cerebellar Symptoms after Recovery from Otogenous Meningitis. (Fall av läkt, diffus, varig, otogen meningit med sekundära lillhjärnssymtom.) E. Erici.—p. 27.

103. **Auditory Reeducation.**—Holmgren reports his experiences with the Maurice kinesiphone, an electrically driven apparatus for inducing tones with a range of about two and a half octaves. In 70 of his 147 cases the deafness was the work of otosclerosis and this was probable in 22 others. In 25 the deafness had been left by chronic otitis media, and in 15 was the result of a "dry" catarrh of the middle ear. The benefit was most pronounced in these two last groups, about half the patients in these groups showing remarkable improvement, but whether more than can be obtained with the ordinary measures, is open to question. Of the 70 patients with certain otosclerosis, only 6 were much improved but 25 showed slight improvement. The much improved patients were all young women. One for three years had been able to hear a whisper only at 4 and 3 meters, but after ten sittings the figures became 10 and 8 meters. These figures for a girl of 19 were 1 and 6 meters before and 4 and 8 meters after a course of twenty-seven sittings. Holmgren remarks that we are frequently consulted on account of deafness brought on by a cold, fatigue, general depression, etc. Whatever treatment is applied is credited with the improvement that follows the subsidence of the occasional cause. This, he thinks, is the explanation for the "brilliant" results that have been reported in French and Belgian literature from the kinesiphone. The principle of the apparatus is simple, and in the hands of a trained attendant, under the supervision of the physician, the method has the advantage of being less expensive than other methods which have to be applied by the physician himself.

Ugeskrift for Læger, Copenhagen

January 4, LXXIX, No. 1, pp. 1-42

105 *"Assisted" Infants up to Two Months of Age. (Erfaringer om Ernæring og Livsvilkaar hos et større Antal "Plejehjælpsborn" i de to første Levemaaneder.) P. Hertz.—p. 4.

105. **"Assisted" Infants.**—By this term Hertz refers to the children of unmarried mothers delivered at the public maternity at Copenhagen, who are given 1.5 kroner (about 40 cents) a week for thirteen weeks after the birth of the child. The woman returns once a month for the money and she is expected to bring her child each time. By this means oversight of the children for two months was possible. Of the total 4,115 of these "assisted" infants, only 1.6 per cent. were exclusively bottle-fed from the first, but this proportion increased by the end of the first month, only 40.7 per cent. being still breast fed at that time, and, by the end of the second month, only 27.3 per cent. The bottle-fed children seemed to thrive under the directions for feeding given the mothers, especially when the mothers could give the child the breast at night although during the day it had to be fed artificially. The mortality was considerably less than in previous years. Hertz disapproves of pasteurized milk, saying, "It would be better if this disappeared entirely from the big city." His objection is that as the milk is always boiled again, just before using, the preceding process is superfluous and only injures the milk unnecessarily.